

**2005 – 2007
Land Preservation Plan**

**Green Acres Program
State Land Acquisition Program**

New Jersey Department of Environmental Protection



December 2004

STATE OF NEW JERSEY

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Executive Summary

Every day in New Jersey, 50 acres of land are developed to meet the housing, employment and transportation needs of an increasing population. While the continued growth of the State's population is a reflection of its strategic location and economic vitality, the impacts of this growth on the State's natural resources are dramatic. The loss of wildlife habitat and increased traffic are common examples of impacts. The State's water resources, both quantity and quality, are also significantly impacted. Greater water usage, increased impervious surfaces and larger pollutant loads combine to create concern for the State's ability to protect the water resources necessary to provide clean water and sustain New Jersey's quality of life, natural resources and economy.

The 2005-2007 Land Preservation Plan has been prepared by the New Jersey Department of Environmental Protection's Green Acres Program to meet the legislative mandate for an open space master plan for the State Land Acquisition Program contained in PL 2002 Chapter 76.

The 2005-2007 Land Preservation Plan adopts the following goals for the preservation of open space in New Jersey:

- To create a system of public and private lands and greenways to protect water resources, biodiversity, and scenic landscapes to preserve open space and provide recreation opportunities;
- To preserve large land parcels to protect New Jersey's biodiversity and water resources;
- To maintain and enhance New Jersey's quality of life by providing accessible recreation, retaining community character and preserving historic sites;
- To foster partnerships with local governments, the conservation community, private sector and federal government through funding, planning, and technical assistance;
- To implement open space policies that are consistent with the New Jersey State Development and Redevelopment Plan and smart growth initiatives;
- To promote the quality of life in the State's urban centers and developed suburbs by providing assistance for open space preservation and park development as integral components of smart growth efforts;
- To complement sustainable natural resource based businesses such as agriculture, forestry, tourism, commercial fishing and recreation equipment retailing.

The Plan contains eight sections that discuss various elements of New Jersey's Open Space Program and the Green Acres State Land Acquisition Program. The Plan is organized as follows:

Introduction provides an overview of current open space issues and scope of the Land Preservation Plan.

New Jersey's Land Preservation Program discusses past State open space planning efforts along with current planning initiatives and contains maps depicting areas of the State where land acquisition will likely take place for water resource protection and public conservation and recreation purposes.

New Jersey Open Space Providers describes the State's open space and recreation system looking at the roles of various public and private agencies in preserving open space and providing recreation opportunities.

State Land Acquisition Process reviews the Green Acres Program's methodology for acquiring land by the State for conservation and recreation purposes and the priority ranking system used to evaluate parcels for acquisition by the State.

2005 – 2007 State Land Acquisition Projects presents the project areas the Green Acres Program will be working in to acquire lands for State public open space and recreation areas.

2004 State Development Projects is a listing of development projects of the Division of Parks and Forestry and the Division of Fish & Wildlife.

Statewide Water Resource Initiatives contains a review of watershed plans that identify areas for based on water resource values in addition other open space planning initiatives.

Implementation Plan outlines strategies for implementation of the Land Preservation Plan.

Introduction

Open space preservation comprises one of the cornerstones of New Jersey's smart growth policy. Nine Green Acres bond issues totaling \$1.4 billion together with funding from the Garden State Preservation Trust Act, which has the potential to provide \$1.9 billion, represent a combined \$3.3 billion public investment in open space preservation and recreation by the State since 1961. New Jersey was ranked second in the nation in a study done in 2001 of state funding for open space preservation. New Jerseyans have continually expressed their support for the State to carry out a comprehensive open space and recreation program. There is no stronger testament of this support than residents consistently voting for open space and recreation referendums not only at the State level, but at the local level as well. In 2005, 231 New Jersey local governments, all 21 counties and 210 municipalities, assessed a special tax for land preservation and recreation purposes. New Jersey is clearly a national leader in local open space preservation with the State's local governments holding a large number of the referendums held nationally over the last three years.

This substantial, long term dedication of funds for land preservation and recreation represents New Jersey's response to an urgent need to protect its water resources, preserve biodiversity, enhance urban centers, create greenways and provide a broad array of recreational opportunities. It is essential to preserving rural landscapes and is a major factor in sustaining New Jersey's \$31 billion tourism industry. New Jersey's open space goals are based on comprehensive analysis and public opinion concerning preservation needs for biological diversity, water supplies, farmland, historic sites and recreation. Given all the attributes and functions of open space, it can be said that open space preservation is one of the most cost effective and efficient means of environmental protection.

New Jersey's natural and recreation resources are facing tremendous pressures from the State's increasing population and development. According to the 2000 Census, the State's population grew by over 684,000 people, an increase of nearly 9% to over 8.4 million people. Rutgers University Center for Remote Sensing and Spatial Analysis examined changes in New Jersey's land use between 1995 and 2000 and determined that a total of 89,888 acres were developed, an area nearly equal in size of Essex County. The Center estimates that 50 acres of land are developed every day in New Jersey, or more than 18,000 acres annually. The implications for natural resources are beyond words. These implications will not only result from the residential, commercial and infrastructure development necessary to accommodate population growth, but also from increased demand for and use of New Jersey's public conservation and recreation resources.

Plan Scope

The Land Preservation Plan outlines the Green Acres State Land Acquisition Program, details the criteria and process by which Green Acres will consider land for acquisition by the State and sets forth policy to guide Green Acres in its state land acquisition efforts.

While the plan does not list individual parcels for state acquisition, it clearly identifies areas of New Jersey that are considered priorities for state land acquisition. The identification of these areas will establish a basis for decision making by the Green Acres Program when both reacting to land offerings and in targeting lands for preservation. State land acquisition activities covered in this plan include all the methods employed by the State to preserve land; fee simple acquisition, the purchase of easements and development rights and the acceptance of donations. In addition to these activities, Green Acres oversees the disposition of state and most local public open space lands through the State House Commission process.

By legislative mandate contained in PL 2002, Chapter 76, this plan is limited in scope to the land preservation activities of the Green Acres State Land Acquisition Program. It is not intended to be a comprehensive open space plan for the state. This plan does not include the land preservation initiatives of New Jersey local governments or conservation organizations, which are essential to the State's open space efforts although it does generally discuss their roles in open space preservation. ***The 2003 Statewide Comprehensive Outdoor Recreation Plan*** contains a more detailed discussion of local government and nonprofit roles in open space issues. The Land Preservation Plan also does not address farmland preservation as it is beyond the purview of the Green Acres Program, although it is discussed in the context of the State's overall land preservation program.

Public Law 2002 Chapter 76 requires that the Green Acres Program prepare an open space plan annually that:

- is prepared in consultation with Department of Community Affairs and the Pinelands Commission,
- identifies areas of the state where the acquisition and development of lands by the State for recreation and conservation purposes is most likely to occur,
- identifies areas of the state where there is a need to protect water resources to assure adequate quality and quantity of drinking water supplies in times of drought,
- provides a proposed schedule and expenditure plan for those acquisitions and developments,
- explains how the acquisition and development of lands for recreation and conservation purposes will be distributed throughout all geo-graphic regions of the state.

In addition to these elements, the legislation also contains these following requirements:

Ranking criteria for State Land projects: requires the establishment of criteria and policies for the evaluation and priority ranking of projects based on water resource features, biodiversity, etc. It assigns 3 times the weight for water resource lands and 2 times the weight for flood prone areas as compared to other priority criteria.

Ranking criteria for Local Government and Nonprofit projects: similar to the state ranking system but has no assigned weight priority.

Evaluation Guidelines: requires the adoption via the New Jersey Register process of guidelines for the state land acquisition ranking system and process.

Rules: rules and regulations must be adopted for activities on conservation and recreation open space lands acquired by the State to prevent the diminishment of water quality. Does not apply to prior acquisitions or to local government or nonprofit project lands.

Garden State Preservation Trust: the Trust must incorporate the open space plan in its report to the Governor and the Legislature and include data on lands acquired by the State for water resource protection.

DEP and Department of Agriculture: DEP and Agriculture are authorized but not required to jointly adopt rules and regulations for agricultural practices to prevent the diminishment of water quality.

Public Law 2002, Chapter 76 directs the Green Acres State Land Acquisition Program to give priority to the protection of water resources and flood prone areas in its acquisitions. As a result of this legislation, Green Acres has revised the ranking system used to evaluate state land projects to reflect the priority weights for water resource lands and floodprone areas. While the protection of water resources through land preservation has been a goal of the Green Acres Program since its inception, this legislation will further focus Green Acres preservation efforts on lands that protect important water resources.

New Jersey Open Space Planning Goals

The 2005-2007 Land Preservation Plan adopts the following goals for the preservation of open space in New Jersey:

- To create a system of public and private lands and greenways to protect water resources, biodiversity, and scenic landscapes and to preserve open space and provide recreation opportunities;
- To preserve large lands parcels to protect New Jersey's biodiversity and water resources;
- To maintain and enhance New Jersey's quality of life and providing accessible recreation, retaining community character and historic landscapes.
- To foster partnerships with the State's local governments, conservation community, the private sector and the federal government through cooperative projects, funding, planning, and technical assistance;
- To implement open space policies that are consistent with the New Jersey State Development and Redevelopment Plan and the State's Smart Growth Policies.

- To promote the economic health and quality of life in the State's urban areas by providing assistance for open space preservation and park development as integral components of urban revitalization's efforts;
- To complement sustainable natural resource-based businesses such as agriculture, forestry, tourism, commercial fishing and recreation equipment retailing.

New Jersey's Land Preservation Program

"The most important single finding is the immediate and compelling need to acquire land for outdoor recreation and water supply facilities..." This statement from ***The Need for a State Recreational Land Acquisition Program*** published by the New Jersey Department of Conservation and Economic Development in 1960, demonstrates that New Jersey has long recognized the relationship between land preservation and the protection of water resources. This recognition has manifested itself in the Green Acres Program, which is now approaching a half century of preserving land for public conservation and recreation purposes. As a public policy, open space preservation has been strongly supported by the public and private sectors. New Jersey has had a long history of government involvement in land preservation and in public parks and recreation. In 1895, Essex County established the first county park system in the United States. Shortly after, the State began to address the recreation needs of its citizens through the acquisition of lands for state parks and wildlife management areas. Bass River State Forest was acquired in 1905, Stokes State Forest in 1907, Lebanon (now Brendan Byrne) State Forest in 1908 and the Hackettstown Fish Hatchery in 1912. Other notable acquisitions included Allaire State Park in 1940, Island Beach State Park in 1953 and Wharton State Forest in 1955.

Various planning activities dating back to the 1920s have called for the acquisition of large tracts of land throughout the state for public park, recreation and conservation purposes. New Jersey's planning has historically considered the need to provide not only open space but also park and recreation opportunities. In 1941 and in 1950, the State Planning Board published plans calling for the acquisition of more land for state public open space and recreation areas. The largest single purchase by the State, 96,000 acres for Wharton State Forest and the purchase of 2,694 acres for Island Beach State Park, were a result of a 1951 bond referendum.

The Regional Plan Association alerted New Jersey to an impending open space and recreation crisis in a 1960 report, ***The Race for Open Space***. The report detailed the state's disappearing acreage and increasing population and was instrumental in the creation of the Green Acres Program in 1961.

In a 1963 report, ***A Pilot Open Space Plan for New Jersey***, the New Jersey Department of Conservation and Economic Development made recommendations for land acquisition statewide to meet the open space and recreation needs of New Jersey's growing population. It noted alarmingly that according to the 1960 Census, New Jersey's population increased from 4.8 million to 6 million over the prior ten years and at over 800 persons per square mile, it was the most densely populated state in the nation. With the passage of the Land and Water Conservation Fund (LWCF) in 1965, the Green Acres Program conducted a series of planning studies as an eligibility requirement for this federal funding. New Jersey prepared seven Statewide Comprehensive Outdoor Recreation Plans (SCORP) between 1966 and 2003. The purpose of these plans has been to provide statewide policy direction and guidance to the State, local governments and conservation organizations in the preservation of open space and the provision of recreation opportunities. The first SCORP, published in 1966, identified areas statewide to protect natural, recreation and historic resources. Each subsequent SCORP has identified regions of the state that contain important

natural resources and recommended their protection either by public acquisition or other methods. Figure 1 and Tables 1 and 2 provide some insight into 1) the types of land (natural resources) preserved by Green Acres State Land Acquisition Program between 1999 – 2003 2) the total number of acres acquired during that time frame and 3) the geographic breakdown by county of these preserved lands. Table 3 illustrates the partnering between Green Acres and local government and nonprofit conservation organizations by identifying the state funds dispersed over that period. The current SCORP, published in March 2003, serves as the State's open space and recreation policy document through 2007. As with previous SCORPs, the 2003 SCORP outlines issues which articulate the State's vision of open space and recreation over the next five years. The 2003 SCORP identifies seven issues to meet current and projected open space and recreation needs.

The following issues from the 2003 SCORP provide the framework which New Jersey will use to meet the recreation and open space requirements of its residents and visitors during the following five years. A primary goal of the 2003 SCORP is the preservation and protection of a sufficient quantity of land to meet the environmental protection, open space and recreation needs facing New Jersey.

Land Preservation

Land preservation is a central component of statewide land use planning. A population of 8.4 million, with a density of 1,134 people per square mile and a population forecast of 9.25 million by 2020, makes land preservation a very serious issue in New Jersey. This issue becomes even more critical when coupled with building permit data showing that between 1997 and 2003 over 250,000 building permits were issued. Given these building trends, the projected buildout of New Jersey over the next 40 years is not improbable. New Jersey's land preservation efforts are carried out under two themes: open space and farmland. Both of these are necessary for the State to protect important natural, recreational and agricultural resources. Open space is an intricate system serving a variety of functions, often concurrently, which are essential in sustaining and enhancing New Jersey as a desirable place to live and work. Land preservation can protect water resources, guide development and growth, protect natural resources and historic resources, preserve farmland, shape community character, provide land for recreation and generate economic benefits. Open space planning plays a crucial role in New Jersey's efforts to protect water resources. Given New Jersey's increasing population with its attendant impacts on water resources and past drought patterns, the use of land preservation as a tool to protect water resources continues to be essential. Open space planning can examine the opportunity to protect wetlands, aquifers, stream corridors and other water resources. Combined with geographic information system mapping and data, open space planning identifies and documents important water resources and articulates preservation strategies. In addition, the protection of water resources complements other open space goals of providing recreation opportunities, creating greenways, maintaining community character and preserving wildlife habitat.

Recreation

Recreation and parks are considered by New Jersey as inseparable from quality of life issues. Recreation in New Jersey comes in many forms, but regardless of the form, it

Figure 1

**Green Acres State Land Acquisition Program
July 1999 through December 2003**

NJDEP 1995 Land Use

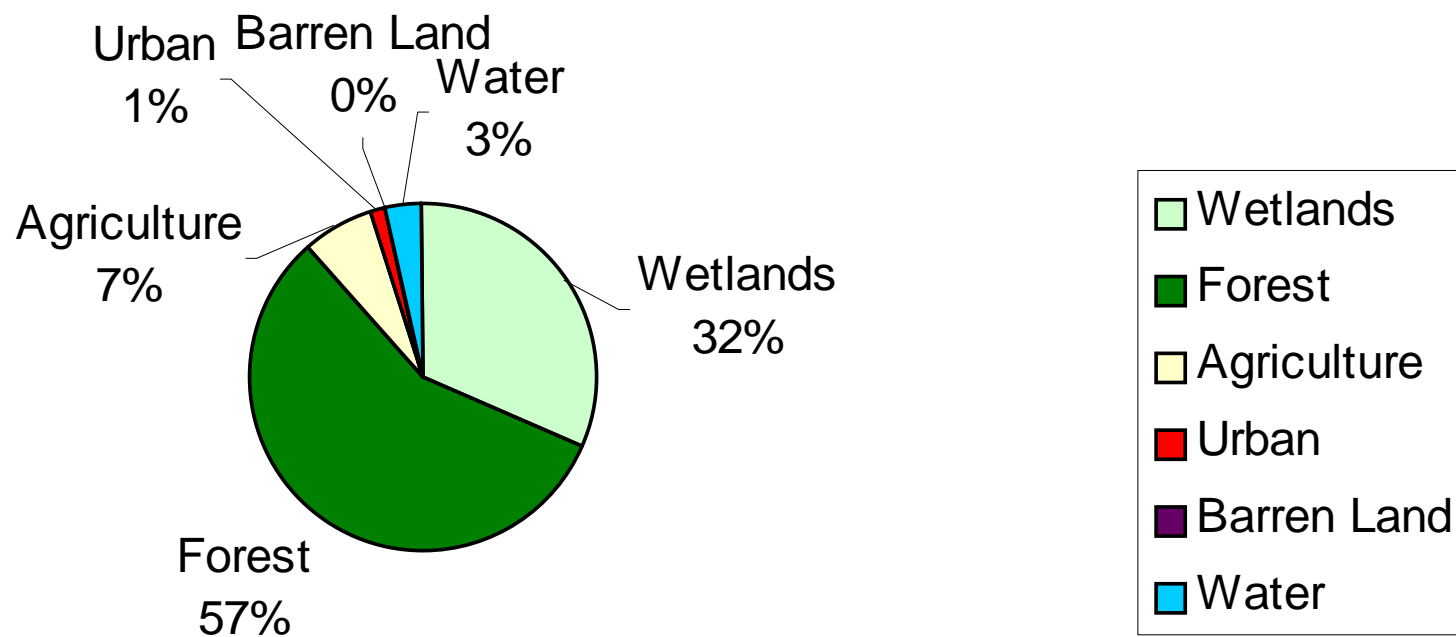


Table 1

**Green Acres State Land Acquisition Program
Land Preserved
July 1999 - December 2004**

<u>Year</u>	<u>Acres</u>	<u>Cost</u>
1999	5,781	\$23,881,289
2000	16,389	\$40,195,320
2001	19,120	\$70,446,290
2002	24,663	\$57,669,334
2003	10,629	\$47,033,991
2004	<u>15,183</u>	<u>\$60,646,227</u>
Total	91,765	\$299,872,451

Table 2

**Green Acres State Land Acquisition
Preserved Lands by County
July 1999 - December 2004**

<u>County</u>	<u>Acres</u>	<u>Cost</u>
Atlantic	14,082	\$15,304,762
Bergen	16	1,218,650
Burlington	3,112	9,943,141
Camden	353	3,528,910
Cape May	3,832	10,481,193
Cumberland	11,123	18,674,989
Essex	1,115	13,276,969
Gloucester	1,907	3,938,556
Hunterdon	5,664	44,509,590
Mercer	989	8,957,496
Middlesex	544	8,862,166
Monmouth	2,196	13,836,411
Morris	9,167	24,474,977
Ocean	5,158	10,430,275
Passaic	2,165	11,354,807
Salem	4,443	11,452,954
Somerset	271	2,098,350
Sussex	17,728	53,059,942
Warren	<u>7,901</u>	<u>34,468,309</u>
Total	91,765	\$299,872,451

Table 3

**Green Acres Program
Local Government and Nonprofit Programs
Land Preserved
July 1999 - December 2004**

<u>Year</u>	<u>Acres</u>	<u>Cost*</u>
1999	2,712	\$16,822,104
2000	6,727	\$38,600,956
2001	6,594	\$59,781,865
2002	11,342	\$68,616,738
2003	7,334	\$56,067,108
2004	<u>6,586</u>	<u>\$51,194,316</u>
Total	41,295	\$291,083,087

** Cost includes only the state funds provided to assist local government and nonprofit conservation organizations in land preservation projects. The figures do not include the local and nonprofit funds that went toward the projects.*

satisfies the human need to play. The demand and need for recreation is driven largely by the State's increasing population. It seems that it is impossible to build enough soccer fields or softball fields in New Jersey. There is a statewide trend of residents living near parks resisting the development of recreation facilities, particularly playing fields. Increased usage translates into greater operational and maintenance costs. Demographic trends point not only to an increasing population, but also the ongoing aging of New Jersey's population. All of these factors mean that public park and recreation agencies must continue to provide the programs and facilities to meet an increasing demand. Annual visitation at state parks tops 15 million and Monmouth and Somerset counties report annual park attendance of nearly four million and two million, respectively.

Urban Open Space And Recreation

According to New Jersey Future, 94% of New Jerseyans live in an urban area, as defined by the United States Census Bureau, tying for first place with California. This represents a five percent increase from 1990. The State Plan's Metropolitan Planning Area contains over 840,000 acres, roughly 17% of New Jersey. The acute need for and intensive use of urban park and recreation areas is a continuing issue in the state. Urban center revitalization efforts will need to include the redevelopment and rehabilitation of existing park facilities as well as creating new park and recreation opportunities. The use of redevelopment projects as a catalyst for park projects and public spaces has proven to be an important tool. In addition to park and recreation issues, urban centers also can have considerable natural resource and open space values. Research conducted in the Arthur Kill region documented the significance of urban habitats. Despite being the most densely populated and industrialized area of New Jersey, it remains a thriving estuarine ecosystem.

State Resource Areas

State Resource Areas contain critical natural resources. The most critical resource, water, is found in all of these resource areas, and is a force in their ongoing protection. In addition, recreation, wildlife, tourism, and agriculture combine to make these areas even more outstanding. The following summarizes the regions of New Jersey that are considered State Resource Areas:

Highlands

The water resources of the Highlands have long been recognized as the region's most valuable natural resource. The Highlands is the source of water for 4.4 million people in New Jersey. Water resources though are only one feature that makes the Highlands unique, 14 million people use the Highlands recreation resources for fishing, hunting, birding, camping and hiking, 246 wildlife species live in the Highlands and 165 historic sites have been identified as well. Over 743,000 people live in the New Jersey portion of the Highlands, an increase of nearly 12% over the 1990 population. With the near build out conditions in some of the surrounding region, the Highlands are expected to add almost 400,000 residents over the next 20 years according to the United States Forest Service's 2002 ***Highlands Regional Study Update***. Despite an impressive record of public land preservation in the Highlands, the region's natural resources remain threatened by growth and urbanization impacts. For example, the Highlands Study using a conservation Gap Analysis Process, found that 77% of high value water resource lands were unprotected by either public ownership or conservation easement. The analysis also showed 60% of high value biodiversity lands and 50% of the high

value forest lands were unprotected. Most alarmingly, the analysis documented that 53% of the total combined high value conservation lands required protection.

Coastal Zone

The State's 127 miles of Atlantic coastline together with the Delaware Bayshore contain estuaries, bays, rivers, streams, beaches and wetlands that provide abundant opportunities for recreation and tourism. Among New Jersey's many natural resources, those of the State's coastal zone represent some of the most important. New Jersey offers residents and visitors a wide variety of water resource features for sailing, boating, fishing, swimming, hunting, canoeing and birding. The Atlantic Ocean, Barnegat, Delaware and Raritan bays and coastal rivers such as the Toms and Mullica provide the setting for these activities. Tidal wetlands provide breeding and nursery habitat for fish and shellfish and provide flood control and pollution abatement. Tourism in New Jersey's coastal communities is a \$16 billion industry. The phenomenal economic power of the Jersey shore does not stop at the beach or boardwalk. Economic impact studies performed in Cape May County document the importance of ecotourism to the local Cape May economy. There is no place in the United States with the concentration of certain species of migrating raptors in the fall or the 1.5 million shorebirds that stop along the county's Delaware Bayshore in the spring. These annual migrations, along with an impressive spring warbler migration, account for over \$42 million in economic benefits to Cape May County. Four coastal counties, Atlantic, Cape May, Monmouth and Ocean had the highest population growth in the 1990s. These four counties accounted for more than one quarter of New Jersey's population growth between 1990 and 2000.

Historic Resources

That New Jersey has consistently identified the protection of its historic heritage in previous SCORP's should not be a surprise. As one of the 13 original colonies, the landscape of New Jersey is steeped in American history. New Jersey's role in the American Revolution was pivotal and this is memorialized at Monmouth and Princeton Battlefield State Parks and sites in Trenton. The Division of Parks and Forestry is the steward of 57 historic sites and districts, which include home villages and lighthouses. Over 280,000 people visited these historic sites in 2001. In an attempt to link New Jersey's Revolutionary War sites, the State is working with the National Park Service on the Crossroads of the American Revolution project. In ***the Economic Benefits of Historic Preservation in New Jersey***, the Rutgers University Center for Urban Policy Research documented the role that historic preservation plays in the State's economy. The research concluded that historic preservation is an economic force in New Jersey supplying more than half a billion dollars to the State's economy.

New York/New Jersey Harbor Estuary

The Harbor Estuary is situated in one of the most urbanized and densely populated regions in the world. Over 20 million people live and work in the area. New York City, Newark, Brooklyn, Jersey City, Elizabeth along with many other urban and regional centers and suburban communities comprise this sprawling landscape. This landscape also contains extensive road systems, airports, port facilities, industrial and commercial land uses. The area has been subject to human activity for nearly four hundred years. But yet despite the impacts from this activity, the Harbor Estuary supports a diverse assemblage of wildlife populations, plant species and ecological communities. Some of the most significant New Jersey ecosystems like the Hackensack Meadowlands are located in the Harbor Estuary. New Jersey and New York City have been active in

preserving land in the Harbor Estuary. The City has preserved more than 1,500 acres and New Jersey has preserved 932 acres between 1994 and 2004.

Water Resource Lands

Many of the State Resource Areas are special because they contain substantial water resources lands. Lands, such as the Greater Sourland Region, are the source of headwaters to many streams that drain into the Delaware, Millstone and Raritan rivers and the Delaware and Raritan Canal, representing the major water supply for central New Jersey. Although the State has made considerable progress in preserving watershed lands, there are many areas that still require protection. By partnering with local governments and conservation groups, the State can address this critical issue. The need for this cooperative approach is realized when looking at data from two of New Jersey's Watershed Management Areas (WMA). WMA 3 and 6 include portions of Bergen, Essex, Morris, Passaic, Somerset and Union counties. Surface and groundwater sources in WMA 3 and 6 supply potable water to over 2.7 million people. However, only 26% of the land in these two WMA is preserved open space. Protecting water resource lands statewide is essential as New Jersey cannot grow smart without an abundant supply of clean water.

Pinelands

The National Parks and Recreation Act of 1978 created the Pinelands National Reserve and, with the subsequent establishment by the State of the Pinelands Commission in 1979, New Jersey has been reaping the benefits of the preservation and growth management of this 1.1 million acre region. The Pinelands Protection Act, administered by the Pinelands Commission, has provided for the preservation of natural resources and traditional lifestyles while allowing sustainable development. The Pinelands landscape is a patchwork of pine and oak forests containing five major river systems, two of which, the Maurice River and three of its tributaries, and the Great Egg Harbor River have been inducted into the Wild and Scenic Rivers System. Environmental amenities include an aquifer system containing 17 trillion gallons of water. The Pinelands also supports a rich diversity of wildlife and plant species and cranberry and blueberry industries. The State has several major open space holdings in the Pinelands. In many regards, the Pinelands are a New Jersey wilderness, a wilderness surrounded by the most urbanized landscape in America. Regional growth areas within the Pinelands are facing increased populations, school enrollments, traffic and property taxes. Two counties, Atlantic and Ocean, with extensive development in Pinelands growth areas and fringe areas outside of the region, exceeded the statewide growth rate according to census data. Although the State's Pinelands acquisition program has preserved over 100,000 acres, there are many areas that still require protection. The protection of the Pinelands has been a feature of New Jersey's SCORP planning for decades. Only continued comprehensive regional planning and growth management can sustain the Pinelands and ensure the vision of protecting critical resources and accommodating agricultural, commercial and residential land uses.

Greenways

Greenways are hardly a new idea in the state; they have been part of New Jersey's landscape for many years. The Delaware and Raritan Canal State Park and Patriots Path are examples of greenways that have been serving the public for many years. Called parkways or greenbelts in the past, greenways have evolved as an efficient solution to the need for public open space throughout New Jersey. Greenways can offer close to home recreational activities such as walking, running, biking and birding.

Those associated with water can provide canoeing and fishing opportunities. Greenways also can protect environmentally sensitive areas, link public open space areas, provide wildlife habitat and preserve community character. Rarely does a greenway serve a single purpose. The Green Acres Program is involved in several ongoing greenway projects statewide ranging from river corridors such as the Musconetcong and Salem and trail corridors including the Appalachian Trail. Garden State Greenways, a project of the New Jersey Conservation Foundation and the Green Acres Program, is designed to help guide land preservation and greenway initiatives throughout New Jersey. The goals of the Garden State Greenways project are to:

- Protect New Jersey's natural resources.
- Maintain and enhance large, significant areas of habitat and environmentally sensitive lands as part of New Jersey's green infrastructure.
- Contain urban sprawl.
- Link components of the green infrastructure throughout the state to provide recreational opportunities within walking distance access to New Jersey residents.
- Foster partnerships among state, federal, local and non-government agencies involved in conservation, recreation and land use planning efforts.

Partnerships

It is hard to imagine open space preservation in New Jersey without partnerships. In fact, it has become common practice to seek partners to leverage funding, share project responsibilities or assist in land management activities. A recent LWCF project, Wildcat Ridge, demonstrates the potential for partnership projects statewide. Located in Rockaway Township in Morris County, this 295 acre addition to Wildcat Ridge Wildlife Management was the number one conservation priority for the Township. The site contained portions of the Beaver Brook wetlands, recognized by the United States Fish and Wildlife Service as a priority wetland. Located approximately 200 feet from the Township's sole source aquifer, preservation of the site was critical for the protection of Rockaway's water supply. As the property owner was asking \$7 million for the site, it was apparent that the acquisition of the property was beyond the means of any one agency. It was possible though, to preserve the site with multiple partners. Natural resource restoration projects are another area where partnerships can play a role. In the City of Rahway, 11 homes located close to the Rahway River had a history of serious flooding. With funding from several public and private agencies and organizations, the homes were acquired, demolished and removed. The 4.5 acre site was regraded, ponds created and planted with native vegetation. The land has been transferred to Union County as part of Rahway River Parkway.

Stewardship

Preserving open space is only part of the State's responsibility. Caring for the lands and resources after they are put into public ownership is equally important. Over the past 40 years, New Jersey citizens have invested state funds for land preservation and have created an endowment of lands. However, like any endowment, these valuable assets must be properly managed. Both state and local governments are challenged to meet the goal of proper stewardship of the public's lands and recreational resources. Over many years, funds for the operation and capital needs in state recreation areas have fallen short of the needs. State public open space and recreation areas are challenged by rapidly increasing visitation. The Division of Parks and Forestry has experienced a more than 4.1 million increase in annual visitation between 1991 and

2001. The need to serve the public through the protection of open space and maintenance of historic and recreational resources is a critical quality of life issue for New Jersey residents. Stewardship also entails enforcement to protect natural resources. The increasing popularity of off-road vehicles (ORV) in New Jersey has presented challenges for the management of public lands and the protection of natural resources. By adopting a policy that prohibits ORV use in state parks, forests and wildlife management areas and increases fines and enforcement, the State has taken an aggressive stance against unlawful use of ORV on state lands. Stewardship also involves working with ORV groups to provide environmentally compatible places to ride. As part of its ORV policy, the Division of Natural and Historic Resources will work to establish appropriate recreational areas for lawful ORV users with the goal of having two new facilities in operation by 2005.

Garden State Preservation Trust Act

Signed into law in 1999, the Garden State Preservation Trust Act (the Act) was a result of the recommendations of Governor's Council on New Jersey Outdoors to create a stable source of funding for conservation and recreation projects. The Act establishes a framework to implement the 1998 voter approved statewide ballot initiative that provides a dedicated source of funding for open space preservation, farmland and historic preservation and the development of parks and recreation facilities. The constitutional amendment allows New Jersey to set aside \$98 million each year for ten years of state sales tax revenues and to allocate up to \$1 billion in bond proceeds over the same time period. The Act also dedicates \$98 million per year in sales tax revenues over a 20 year period beginning in 2009 to service bond debt.

In addition to providing funding, the Act also established the Garden State Preservation Trust. This nine member board reviews and approves projects for funding by the Department of Environmental Protection and the State Agriculture Development Committee. Between June 1999 and July 2004, the Trust approved over \$954 million (Tables 4 & 5) for state, local government and nonprofit open space preservation and park and recreation projects.

The Act also continues the payments of in lieu of taxes to municipalities in which lands are purchased by the Green Acres Program for state conservation and recreation purposes. The Act includes both the 13 year declining percentage schedule which had been a fixture in the Green Acres bond acts between 1971 and 1995 and institutes a new per acre payment depending on the acreage of tax exempt land in a municipality owned by the State for recreation and conservation purposes or by a nonprofit conservation organization. Payments for in lieu of taxes made in September 2004 amounted to just over \$8.4 million.

Table 4

**Garden State Preservation Trust Act Funding
for
Green Acres Open Space and Recreation Projects**

Summary

June 1999	\$ 61,500,000
November 1999	\$ 62,400,000
April 2000	\$ 74,600,000
October 2000	\$ 77,900,000
April 2001	\$138,300,000
May 2001	\$ 12,800,000
October 2001	\$ 11,692,000
June 2002	\$115,300,000
October 2003	\$174,700,000
July 2004	<u>\$225,600,000</u>
Total	\$954,792,000

Note: Also includes funds from Green Acres Bond Act, loan repayments, the Land and Water Conservation Fund and the Forest Legacy Program.

Table 5

**Project Funding Approvals
June 1999 – July 2004**

<u>Project Type</u>	<u>Funding</u>
State Land Acquisition	\$375,000,000
Local Government Acquisition	\$361,800,000
Local Government Park Development	\$128,500,000
Nonprofit Acquisition and Park Development	\$ 88,500,000
Coastal Blue Acres Acquisitions	<u>\$ 992,000</u>
Total	\$954,792,000

Note: Includes funding from the Garden State Preservation Trust Act, Green Acres bond acts, loan repayments, the Land and Water Conservation Fund and the Forest Legacy Program.

GIS Open Space Maps

With the passage of PL 2002, Chapter 76, Green Acres has been directed to provide protection of water resources and flood prone areas through its land acquisition efforts. While protection of water resources has always been a goal of the Green Acres Program and the SCORP, Green Acres has officially revised its ranking system used to evaluate State land acquisition projects so as to further focus preservation efforts on lands that protect water resources. (See State Land Acquisition Project Process for the State Open Space Acquisition Priority Ranking System).

Driven by the abundance of statewide Geographic Information System (GIS) natural resource data, the environmental analysis portion of the ranking system was revised and automated. These same statewide natural resource data sets utilized in the ranking process were appropriately combined to generate a series of maps identifying areas around the State that because of their moderate or significant natural resources should be preserved. Additional data sets that reflect the goals of the Natural & Historic Resource Programs in DEP were also incorporated into the map series.

The SCORP continues to serve as the State's open space and recreation policy document. The attached GIS Land Preservation Plan Maps will provide visual support to these policies and the additional water protection requirements of PL 2002, Chapter 76.

Map 1

Water Resources: indicates areas of the state that are important to the State's water quality and quantity along with areas prone to flooding.

Map 2

Priority System Factors: is a compilation of the environmental data utilized in the priority ranking system reflecting the Act's requirement of tripling water resource values and doubling the flood prone values.

Map 3

Priority System Factors and Natural Resource Agency Priorities: has the priority system factors overlaid with additional priority areas identified by the New Jersey Department of Environmental Protection's resource management agencies.

Map 4

Natural Resource Agency Priorities and Water Resource Data: compiles both Map 1 and Map 3 to denote areas of the state that have strong conservation worth in addition to water quality value.

Map 5

Open Space & Preserved Open Space: overlays existing preserved open space onto Map 4 revealing the areas of the state open to future preservation.

Water Resources

Map 1

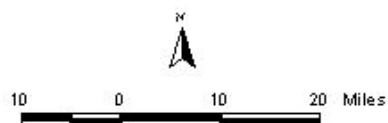
Water Resource Data

- Moderate Quality
- High Quality

Flood Prone

- Moderate Threat
- High Threat

- Water Bodies



prepared January 13, 2005
NJDEP Green Acres Program

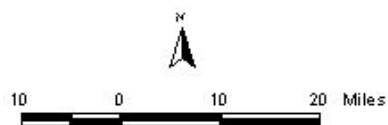
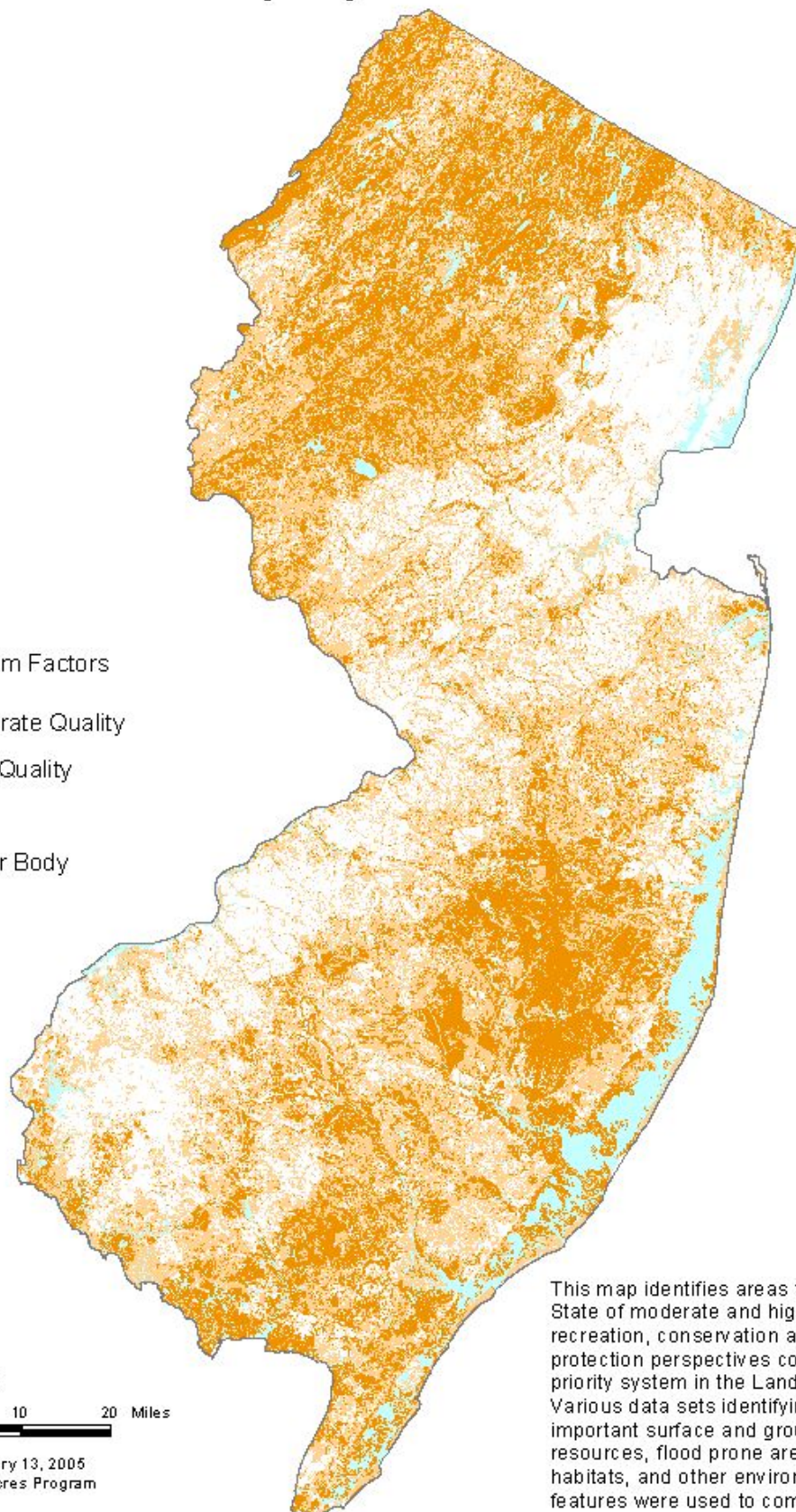
This map identifies areas throughout the State of moderate and high value in the protection of the quality and quantity of the State's water supply and flood protection. Various data sets identifying the State's important surface water, groundwater and FEMA resources were used to compile this map.

Priority System Factors

Map 2

Priority System Factors

-  Moderate Quality
-  High Quality
-  Water Body



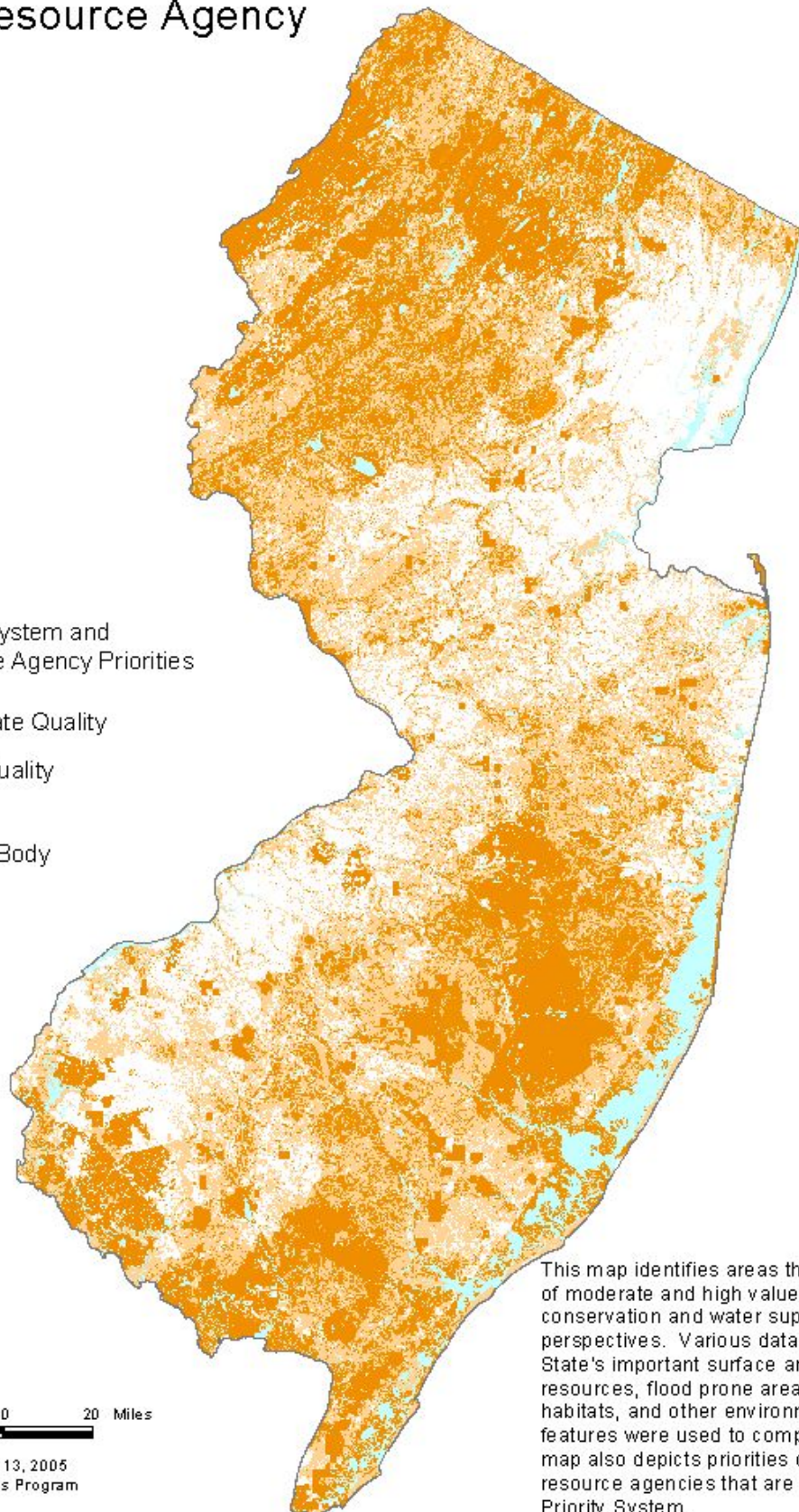
prepared January 13, 2005
NJDEP Green Acres Program

This map identifies areas throughout the State of moderate and high value from recreation, conservation and water supply protection perspectives contained in the priority system in the Land Preservation Plan. Various data sets identifying the State's important surface and groundwater resources, flood prone areas, landscape habitats, and other environmentally sensitive features were used to compile this map.

Priority System Factors and Natural Resource Agency Priorities

Priority System and
Natural Resource Agency Priorities

- Moderate Quality
- High Quality
- Water Body



prepared January 13, 2005
NJDEP Green Acres Program

This map identifies areas throughout the State of moderate and high value from recreation, conservation and water supply protection perspectives. Various data sets identifying the State's important surface and groundwater resources, flood prone areas, landscape habitats, and other environmentally sensitive features were used to compile this map. This map also depicts priorities of the State's natural resource agencies that are not included in the Priority System.

Natural Resource Agency Priorities and Water Resource Data

Priority System and Natural Resource Priority

- Moderate Quality
- High Quality

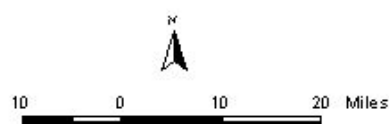
Water Resources

- Moderate Quality
- High Quality

Flood Prone

- Moderate Threat
- High Threat

- Water Bodies



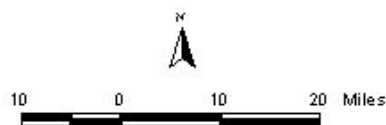
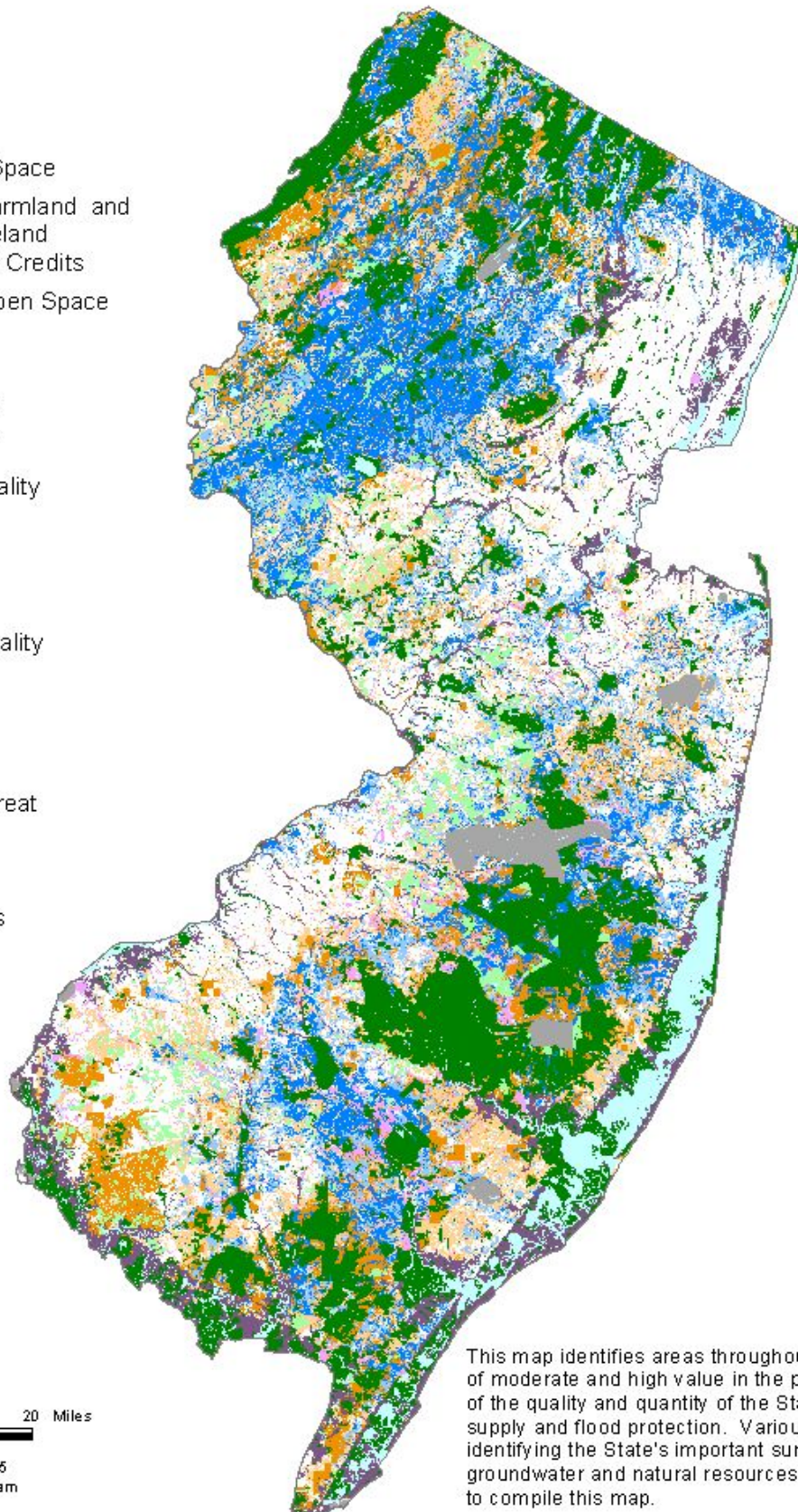
prepared January 13, 2005
NJDEP Green Acres Program

This map identifies areas throughout the State of moderate and high value from recreation, conservation and water supply protection perspectives. Various data sets identifying the State's important surface and groundwater resources, flood prone areas, landscape habitats, and other environmentally sensitive features were used to compile this map.

Open Space Plan & Preserved Open Space

Map 5

- Preserved Open Space**
- Preserved Farmland and Severed Pineland Development Credits
 - Preserved Open Space
 - Military
- Natural Resource Agency Priorities**
- Moderate Quality
 - High Quality
- Water Resources**
- Moderate Quality
 - High Quality
- Flood Prone**
- Moderate Threat
 - High Threat
 - Water Bodies



prepared January 13, 2005
NJDEP Green Acres Program

This map identifies areas throughout the State of moderate and high value in the protection of the quality and quantity of the State's water supply and flood protection. Various data sets identifying the State's important surface water, groundwater and natural resources were used to compile this map.

New Jersey Open Space Providers

As of January 1, 2005, there were 1,122,460 acres of land statewide being used for conservation and public recreation purposes. This total does not include 149,414 acres of preserved farmland acreage. Federal, state, county and municipal agencies have preserved 1,056,374 acres of land for public recreation and open space uses. Nonprofit conservation organizations have preserved 66,086 acres of land statewide (Map 6). Table 9 at the end of this section reports county by county acreage up to 1/01/03.

The National Park Service and the United States Fish and Wildlife Service represent federal government efforts in open space and recreation in New Jersey. These two agencies manage over 113,000 acres of land, 10% of the State's open space. This figure represents an increase of 20,000 acres since 1993 and is largely attributable to the ongoing expansion of the national wildlife refuge system in New Jersey by the US Fish and Wildlife Service. In addition, New Jersey's state government agencies administer 696,934 acres or 62% of the State's preserved recreation land and open space. County and municipal governments were responsible for 197,007 acres of public parkland across the state. These lands comprised 18% of New Jersey's preserved public open space. New Jersey's 21 counties managed 99,360 acres of parkland and the State's 566 municipalities were responsible for 97,647 acres of parkland. Conservation organizations managed 5% of New Jersey's open space.

New Jersey is fortunate that in addition to abundant natural resources, there are a variety of public and private agencies, which contribute to the State's open space system. These agencies ply their trade in a state with five distinct physiographic provinces ranging in elevation from sea level in the south and east to over 1,800 feet in the northwest. As a peninsula, water is a primary feature of the New Jersey landscape, which is dominated by 127 miles of Atlantic Ocean coastline. New Jersey is ecologically unique, very different northern and southern plant and wildlife communities call the state home, making New Jersey's ecosystems among the most diverse in the nation and a leader in statewide biodiversity efforts.

The protection of water resources is a critical public policy in New Jersey. Land preservation is one of the best methods available to the State, local governments and conservation organizations to protect water resources. Coupled with recent initiatives to upgrade the water quality designations of certain reservoir systems and streams as Category One waters, these actions demonstrate the State's commitment to employ a diversified approach to preserve its water resources.

Federal Government

The presence of the federal government in New Jersey is a reflection of the state's strategic location and physiographic diversity. Federal agencies provide important components of the New Jersey open space system. The United States Fish and Wildlife Service has been particularly active in recent years in land preservation, management and public recreation in New Jersey. Together with the National Park Service, these two agencies manage over 112,400 acres of public open space in New Jersey. Tables 6 and 7 summarize funding for federal projects in New Jersey.

Map 6

Preserved Open Space

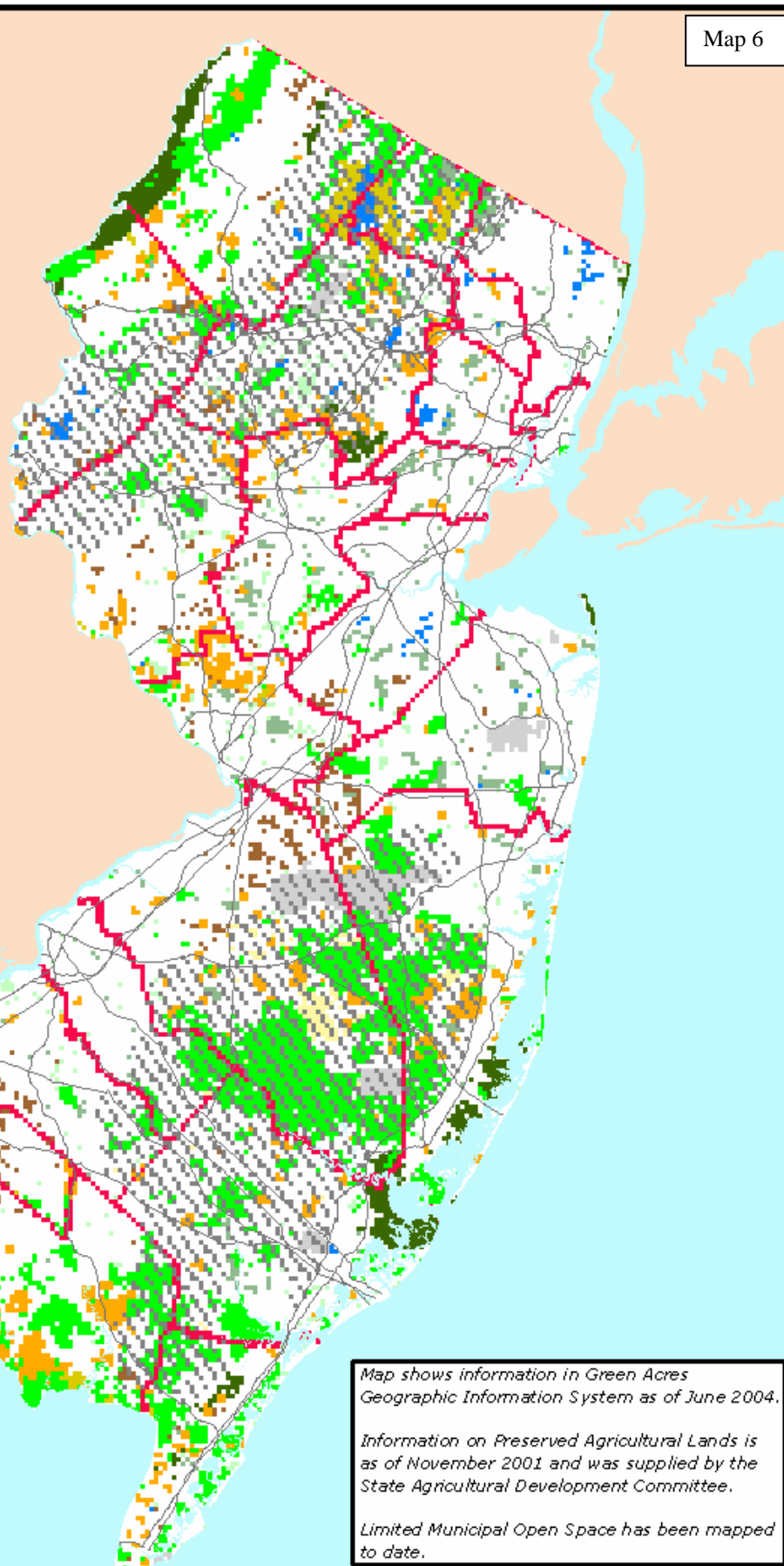
- Federal Open Space Lands
- State Open Space Lands
- County Open Space Lands
- Municipal Open Space Lands
- Nonprofit Lands
- Conservation Easements
- Preserved Agricultural Lands
- Pinelands Development Credits (Severed)

Not all lands have been mapped to date.
Other Features

- County Boundaries
- Major Roads
- Water Supply Mgmt. Areas
- Highlands & Pinelands Regions
- Federal Military Lands

0 2.5 5 10 Miles

September 23, 2004



Map shows information in Green Acres Geographic Information System as of June 2004.

Information on Preserved Agricultural Lands is as of November 2001 and was supplied by the State Agricultural Development Committee.

Limited Municipal Open Space has been mapped to date.

Table 6

**New Jersey Federal LWCF Project Funding Summary
1965-2004**

<u>Project</u>	<u>LWCF Total</u>
Cape May National Wildlife Refuge	\$ 19,762,200
Delaware Water Gap National Recreation Area	\$ 70,811,673
Edison National Historic Site	\$ 275,000
Edwin B. Forsythe National Wildlife Refuge	\$ 24,746,680
Gateway National Recreation Area	\$ 11,963,000
Great Swamp National Wildlife Refuge	\$ 12,507,545
Morristown National Historic Park	\$ 2,069,996
Pinelands National Reserve	\$ 31,527,790
Sterling Forest	\$ 17,500,000
Wallkill River National Wildlife Refuge	<u>\$ 15,756,552</u>
New Jersey Federal LWCF Project Total:	\$206,920,436

Table 7

**Federal Funding Programs
for
New Jersey Open Space and Recreation Projects
1965-2004**

<u>Program</u>	<u>Funding Awarded</u>
Land and Water Conservation Fund*	\$113,877,636
Urban Parks and Recreation Recovery	\$ 19,150,042
Pinelands Section 502	\$ 53,650,000
National Coastal Wetlands Conservation	\$ 6,210,000
Forest Legacy Program	\$ 16,034,000
Transportation Equity Act Funding	\$ 2,675,000
Recreational Trails Program	\$ 4,326,604
National Oceanic and Atmospheric Administration	\$ 1,744,100
National Scenic Byways	<u>\$ 1,000,000</u>
Total	\$218,667,382

As of December 2004. Please note that these Federal programs have varied start dates for the provision of funding to New Jersey.

* Federal assistance to state and local government projects.

The National Park Service is responsible for some of the most outstanding recreation resources in New Jersey. In 2002, close to six million people visited National Park Service sites in New Jersey. The Sandy Hook Unit of the Gateway National Recreation Area is located on a peninsula at the northern tip of Monmouth County and features seven miles of ocean beaches and coves, hundreds of acres of barrier beach vegetation and the historic Fort Hancock and Sandy Hook Lighthouse.

The Delaware Water Gap National Recreation Area is located along the Delaware River between New Jersey and Pennsylvania. The Delaware River is the only large free flowing river on the eastern seaboard. The portion of the river that flows through the Delaware Water Gap National Recreation Area was inducted into the National Wild and Scenic Rivers system in 1978 as part of thirty-seven mile segment beginning in Port Jervis, New York. The park is located within an hour drive from major population centers in northern New Jersey. It is also contiguous with major public open space holdings such as Stokes and Worthington State Forests. The Park Service manages approximately 35,000 acres of the National Recreation Area in New Jersey.

The National Park Service's role in New Jersey goes beyond park management. The Land and Water Conservation Fund (LWCF) and the Urban Park and Recreation Recovery Program are important facets of New Jersey's open space and recreation funding. A total of 300 projects have been funded in New Jersey using close over \$108 million from the LWCF. This funding has been used to preserve over 72,000 acres in New Jersey and develop over 230 park and recreation projects. The Urban Park and Recreation Recovery Program has provided over \$19 million for recreation projects in urban centers throughout New Jersey.

The United States Fish and Wildlife Service is another federal agency that is active in preserving open space in New Jersey. New Jersey's five National Wildlife Refuge's comprise 68,900 acres of land devoted to the protection and stewardship of federal trust wildlife resources that include migratory birds, anadromous fish and federally listed threatened and endangered species. Approximately 10,000 acres were acquired by the Service as additions to the refuge network in the state between 1995 and 2000 and the Service remains active in pursuing acquisition opportunities to expand the existing refuge system in New Jersey. The Service's New Jersey field office is involved in preservation planning for the Hackensack Meadowlands and the New York/New Jersey Harbor Estuary.

The United States Department of Defense participates in the open space arena through the Army Corps of Engineers and an extensive system of military installations located throughout New Jersey. Fort Dix, Picatinny Arsenal, Earle Naval Weapons Station and McGuire Air Force Base help maintain the character and integrity of existing public open space by preventing incompatible development from encroaching.

The Army Corps of Engineers is primarily responsible for the planning and construction of federal flood control, navigation and beach replenishment projects. The Corps maintains the Cape May and Manasquan canals, which in addition to being navigational

waterways, provide public access for fishing. The Corps is developing a restoration plan for the Hudson Raritan Estuary. The Corps is also working with the State to acquire 5,350 acres of natural flood storage areas in the central Passaic River Basin for flood control and water resource protection purposes.

New Jersey has worked closely with the Department of Agriculture's Forest Legacy Program to preserve nearly 12,000 acres of important forest lands in the Highlands region including areas of Newark's Pequannock Watershed. A program of United States Forest Service, Forest Legacy works with state governments to identify and protect significant forested areas that are threatened by development. An additional 5,300 acres have been targeted for preservation using Forest Legacy funding. The Forest Service has also recently updated its 1992 Highlands report, which identifies important water resources in the region.

The United States Department of Transportation has provided funding to New Jersey through its National Scenic Byways Program. Route 29 was nominated as the first state designated road under this federal program that helps preserve scenic corridors. Approximately 35 miles long and bordering the Delaware River, the Route 29 Scenic Byway stretches from the historic areas of Trenton in Mercer County to the rural landscapes of Hunterdon County. A 220 acre property in the Delaware River corridor was preserved in 2002 using funds from the National Scenic Byways Program and the Garden State Preservation Trust.

Regional

The New Jersey Pinelands is a State Resource Area. This internationally recognized area is 1.1 million acres in size and occupies 22% of New Jersey's land area. Its political jurisdiction takes in all or portions of 56 municipalities and seven counties in New Jersey. Underlying much of the Pinelands is the Cohansey Aquifer, estimated to contain over 17 trillion gallons of water.

Water resource protection remains at the forefront of the Pinelands program. Environmental monitoring confirms that the most important drainage areas in the heart of the Pinelands retain their natural qualities. The Commission is leading the effort on a comprehensive assessment of the Kirkwood-Cohansey aquifer, the lifeblood of the Pinelands ecosystem. These projects will ensure that Pinelands water resources will be protected.

The State has substantial open space holdings in the Pinelands which offer many recreation activities. The Pinelands Commission has regulatory authority over most of the National Reserve area, in addition to preparing and updating the ***Pinelands Comprehensive Management Plan***. The Pinelands Commission oversees the acquisition of land with federal funds in cooperation with the Green Acres Program. Lands acquired are added to state parks, forests and wildlife management areas. These acquisitions are needed to maintain the overall integrity of the Pinelands fragile ecosystem and provide important outdoor recreation opportunities.

Over 110,000 acres in the Pinelands have been preserved using Green Acres, LWCF and Pinelands 502 funds. Along with traditional land preservation funds, the Pinelands also benefit from the Pinelands Development Credit Program, a transfer of development rights program, and the Limited Practical Use Program which acquires small land

parcels which cannot be used in a way consistent with zoning. Combined, these programs have preserved over 38,000 acres in the Pinelands.

The Hackensack Meadowlands District encompasses 32 square miles, over 19,700 acres, in densely populated Bergen and Hudson counties. The New Jersey Meadowlands Commission is empowered with considerable environmental protection growth management and solid waste mandates. The Meadowlands are a thriving urban estuary, and an important wetland complex of the New York-New Jersey Harbor Estuary. The Commission has been active in open space planning in the District. It has prepared a master plan, which identifies 8,400 acres for preservation.

Another agency that plays an important role in urban open space and recreation in New Jersey is the Palisades Interstate Park Commission, which manages about 2,500 acres of Hudson River shoreline. Included in this acreage are the Palisades cliffs, which provide dramatic views of Manhattan. The New Jersey section of the park system was dedicated in 1909 and is 13 miles long containing 30 miles of hiking trails, two public boat basins along with other park and recreation facilities. The park protects important geologic features and vegetation communities. The Park Commission also manages extensive lands in southern New York State, including the Sterling Forest tract.

Like New York City, the City of Newark is the owner of a large land area purchased to preserve the quality of drinking water for its residents. Newark's Pequannock Watershed is a 35,000 acre forested preserve located in the Highlands area of Passaic, Morris and Sussex counties. It contains a series of four reservoirs, smaller ponds, wetlands and large tracts of unbroken upland forest. The watershed contains some of the most wild and rugged landscapes in New Jersey. These lands provide important habitat for threatened and endangered species such as cooper's hawk, barred owl, red-shouldered hawk, bog turtle and timber rattlesnake. Recognizing the critical importance of the Pequannock Watershed, the Green Acres Program in cooperation with the City of Newark has initiated a conservation plan aimed at the permanent protection of the critical watershed area. This cooperative planning has yielded the protection of over 18,000 acres using a mix of fee and easement purchases. The preservation of the watershed is considered essential to maintain the character of the Highlands.

Regional open space preservation issues will continue to be a focus of planners and providers. The interrelated concepts of biodiversity, landscape ecology and the protection of water resources transcends simple political boundaries. Regional projects can provide comprehensive protection, accomplish multiple objectives and can be more cost effective.

State Government

The New Jersey Department of Environmental Protection is responsible for the management of the State's public open space and recreation areas. The Department has two divisions, which directly oversee the administration and operation of the State's open space and recreation infrastructure. The Division of Parks and Forestry and the Division of Fish and Wildlife are responsible for over 696,000 acres of public open space which represents 62% of New Jersey's existing public open space acreage. There are also several other agencies within the Department of Environmental Protection that provide support for the State's open space and recreation infrastructure through preservation, regulatory, funding and planning programs.

The Division of Parks & Forestry provides the operation, management, maintenance and protection for 39 state parks, 11 state forests, three state recreation areas, 42 natural areas and five state marinas and 57 historic sites and districts. Together, these sites total over 364,000 acres and are a critical component of New Jersey's open space and recreation infrastructure. State resource areas such as the Pinelands and the Highlands are defined by the presence of state parks and forests. Over 45 million people visited state park system facilities between 2000 and 2003. The Division forecasts that annual visitation will be 17.5 million by 2005.

The preservation and stewardship of the State's diverse natural, recreational and historic resources is the central mission of the Division. State parks and forests support a wide range of outdoor recreation activities that reflect the diverse leisure pursuits of New Jerseys. Some areas cater to passive recreation and are largely undeveloped. Other sites, such as recreation areas, are more intensively developed and used. The intrinsic value of these lands, many of them located in remote forested settings, offer a much needed respite for state residents.

The Division of Fish and Wildlife is the agency responsible for the protection, management and enhancement of New Jersey's wildlife resources. The Division carries out a comprehensive program of research, education, management and law enforcement activities. Currently, there are 120 wildlife management areas totaling over 274,000 acres located throughout the state. In addition to providing outstanding hunting and fishing, the wildlife management areas also offer a variety of other recreation activities.

The Historic Preservation Office, within the Department of Environmental Protection is responsible for enhancing the quality of life for the people of New Jersey through the preservation and appreciation of New Jersey's history. The HPO administers State & Federal Historic Preservation programs for New Jersey and offers technical assistance and guidance for individuals, organizations, and government agencies in the identification, evaluation and protection of historic and archeological resources.

The New Jersey Water Supply Authority operates the Spruce Run, Round Valley, and Manasquan Reservoirs and the Delaware and Raritan Canal. All four have public recreation areas that offer fishing, boating and at Round Valley and Spruce Run, swimming. The reservoirs are unique in that they were planned with both water supply and recreation objectives. The North Jersey District Water Supply Commission manages two reservoirs in the New Jersey Highlands. Both provide public recreation opportunities as part of a pattern of open space ownership that helps protect the landscape of the region.

Within the Department of Environmental Protection, there are several agencies that support New Jersey's open space infrastructure. These agencies are primarily concerned with the regulation and protection of New Jersey's natural resources. The Land Use Regulation Program administers many permit programs that have a direct bearing on open space resources. The Coastal Area Facility Review Act requires public access for certain waterfront projects and the Freshwater Wetlands Protection Act regulates the development of recreational facilities such as boardwalks and boat ramps in freshwater wetlands. Other permit programs that affect open space and recreation

resources include the Waterfront Development Act, Riparian Lands Management Program and the Flood Hazard Area Control Act.

The Department's Watershed Management works with regional groups to protect and manage natural resources on a watershed basis. Many of these groups involved in the process are focusing on land preservation as a strategy to protect water resources and some have prepared plans that have identified critical water resources lands in their respective watersheds.

Given the dominance of water in New Jersey's landscape, it is not surprising for the State to be involved in national water resource programs. New Jersey has three estuaries enrolled in the National Estuary Program, each one representative of the geographic diversity found in New Jersey. The New York-New Jersey Harbor Estuary takes in the most urbanized and densely populated area of New Jersey. Despite the impacts of four centuries of human occupation and development, the estuary remains a vital ecosystem with many sites available for preservation and restoration. The Barnegat Bay Estuary represents another regional approach to preserving important natural and recreation resources. Barnegat Bay's watershed, located in one of the fastest growing areas of the state, is the focus of efforts to deal with growth and urbanization impacts.

Delaware Bay, the third estuary program in New Jersey, faces many of the same issues and its future, like that of the other estuaries, is linked to regional management of growth and natural resources. In addition to these estuaries, three New Jersey river systems, the Delaware, Great Egg Harbor and the Maurice have been designated as National Scenic and Recreation Rivers.

The New Jersey Natural Lands Trust was created in 1968 by the New Jersey Legislature as an incorporated independent State agency with the mission to preserve land in its natural state for the enjoyment of the public and to protect biodiversity primarily through fee simple donations or conservation easements. Operating under the Division of Parks and Forestry, it is an independent land trust organization and an entity of State government. The Trust is responsible for nearly 14,000 acres that are managed to conserve endangered species habitat, rare natural features and significant ecosystems. The unique role of the Natural Lands Trust allows it to operate both as a State agency and as an independent nonprofit organization. This dual nature enables the Trust to work closely with state agencies, nonprofits and landowners.

The Tax Exemption Program, administered by the Green Acres Program, was created to help satisfy the need for open space lands available for public recreation use. The Tax Exemption Program provides a complete exemption from local property taxes for a renewable period of three years to eligible nonprofit organizations which own suitable recreation or conservation land and make it publicly accessible. Currently, 72 organizations are enrolled in the program, protecting over 60,000 acres of land statewide. The Tax Exemption Program remains a cost effective way for the State to preserve open space and provide public recreation opportunities.

Providing funding for open space preservation is often a challenge. The New Jersey Environmental Infrastructure Financing Program provides funding for New Jersey's land preservation efforts. It provides low interest loans to local governments to acquire lands

that protect water resources. The program has provided more than \$28 million to local governments for land preservation projects which protect water resources.

The Passaic River Basin Buyout Program has used nearly \$15 million from the 1995 Green Acres Bond to acquire 123 homes in the river's flood hazard area. After acquisition is complete, the home is demolished and the site maintained as open space. In New Jersey's coastal area, the Coastal Blue Acres Program, used \$6 million from the same bond to provide grants and loans to local governments to acquire storm prone lands. The bond also provided \$9 million for the acquisition of storm damaged properties by local governments which remains unspent.

These programs are examples of alternative funding initiatives that can be used to achieve multiple conservation and recreation objectives. In partnership with local governments, they have provided open space and recreation opportunities, flood protection, growth management and water resource protection.

County Government

New Jersey's 21 counties represent an essential element of the State's open space provider system managing over 99,000 acres for public conservation and recreation purposes. Generally, New Jersey's municipalities tend to concentrate on smaller, user intensive recreation facilities, while counties generally provide larger, resource based, multiple use facilities. Counties have a special role in integrating recreation, open space and environmental protection.

Counties have taken advantage of State legislation that allows counties and municipalities to assess a tax for open space preservation, historic and farmland preservation, and park and recreation purposes. Every county in New Jersey collects an open space tax and these assessments total nearly \$160 million annually (Table 8).

Municipal Government

New Jersey's 566 municipalities manage nearly 98,000 acres and governments are the prime providers of daily recreation programs and facilities for local residents. Close to home recreation defines the role of municipal recreation. Municipalities offer recreational programming that satisfies the needs of preschoolers, teens, adults and senior citizens. Providing and maintaining park and recreation areas coupled with programming for diverse populations, makes municipal recreation in New Jersey very challenging.

Municipalities are also active participants in land preservation. Municipalities have come to realize that with growth often comes demands for local services such as schools. Often, the tax rate generated by new development are insufficient to meet the costs created by an increased population. Given these impacts, municipalities see open space preservation as an integral component of community planning. As part of the municipal planning process, open space preservation can be designed and implemented to enhance the quality of life, protect natural resources, provide recreation opportunities and avoid excessive service costs associated with poorly planned sprawl development. By planning for open space, municipalities help to channel development to appropriate areas, which fosters growth compatible with community character. Municipalities are the front lines of smart growth in New Jersey.

Faced with growth pressures resulting from seemingly endless suburban sprawl, municipalities have also turned to open space and recreation taxes to fund land preservation and recreation projects. In 2005, 210 New Jersey municipalities will collect over \$58 million a year in open space taxes.

Table 8

New Jersey County Open Space Tax Programs

<u>County</u>	<u>Year Approved/Increased</u>	<u>Rate Cents Per \$100</u>	<u>Annual Tax Collected</u>
Atlantic	1990/1998	2 ct.	\$ 5,015,000
Bergen	1998/2003	1 ct.	\$ 9,500,000
Burlington	1996/1998	4 cts.	\$ 9,500,000
Camden	1998	1 ct.	\$ 2,345,000
Cape May	1989	1 ct.	\$ 2,400,000
Cumberland	1994	1 ct.	\$ 514,000
Essex	1998	1 ct.	\$ 5,346,000
Gloucester	1993/2000/2004	4 cts.	\$ 5,000,000
Hudson	2003	1 ct.	\$ 3,500,000
Hunterdon	1999	1-3 cts.	\$ 5,278,000
Mercer	1989/1998/2004	3 cts.	\$ 8,000,000
Middlesex	1995/2001	3 cts.	\$ 18,476,000
Monmouth	1987/1996/2002	2.7 cts.	\$ 16,000,000
Morris	1992/1998/2001	5¼ cts.	\$ 30,000,000
Ocean	1997	1.2 cts.	\$ 6,252,000
Passaic	1996	1 ct.	\$ 2,780,000
Salem	2002	2 cts.	\$ 560,000
Somerset	1989/1997	3 cts.	\$ 12,475,000
Sussex	2000	up to 2 cts.	\$ 2,239,000
Union	2000	1.5 cts.	\$ 6,985,000
Warren	1993/1999/2002	6 cts.	<u>\$ 4,878,000</u>
Total			\$157,127,000

Commercial and Nonprofit

Commercial and nonprofit providers partner with government to provide a comprehensive system of open space and recreation for the citizens of New Jersey. New Jersey's \$31 billion travel and tourism industry is fertile ground for commercial recreation operators. These operators satisfy a considerable portion of the public recreation demand. Commercial recreation facilities include theme parks, amusement parks, campgrounds, marinas, resort hotels, equestrian centers and ski areas. Tourism continues to be an integral component of New Jersey's economy supporting 836,000 jobs and nearly \$18 billion in wages. Although not traditionally considered as a provider, farmland preservation has assumed an important role in open space efforts. Agricultural lands can help maintain contiguous open space, preserve woodlands and protect wildlife habitat and water resources. Many of the lands are used for hunting, fishing and hiking with permission of the landowner. The small town and rural life style associated with agricultural areas remains an attractive feature of the New Jersey landscape. The Green Acres Program and the Farmland Preservation Program have worked together on land preservation projects. Greenway projects are especially well suited for cooperative projects. Preserved farmland can buffer greenway parcels from incompatible development retain the scenic quality of viewsheds and protect water resources.

Green Acres has enjoyed a long and successful relationship with the many nonprofit land trusts in New Jersey. Nonprofit entities make significant contributions to the open space and recreation network in the state. New Jersey is fortunate to have many conservation organizations active within the state. Their work includes land acquisition and preservation, technical assistance, research and advocacy. The ability of these groups to rally public support and to cultivate advocacy for open space projects is an important facet of their work.

The Green Acres Program and New Jersey Conservation Foundation are working to create a map-based, statewide vision for open space and greenways, known as Garden State Greenways. Based on input from the conservation community and various levels of government, together with Geographic Information System (GIS) mapping and analysis, the project will identify the potential for a statewide system of interconnected open space, a green infrastructure of forest, fields, wetlands, farms and recreation lands.

The purpose of Garden State Greenways is to provide local governments, state agencies, and nonprofit conservation organizations with a planning resource, in the form of maps and GIS data, that will help them achieve their land preservation goals. Garden State Greenways will provide a geographic base that can be used to help guide preservation opportunities, target urban greenway initiatives and coordinate partnerships throughout the state.

Individual property owners also participate in New Jersey's open space system by allowing access to their property via an easement or another form of agreement. Land owners also contribute by donating land or land value in conservation transactions. In addition to state and federal tax credits for land donations, property owners receive the benefit of knowing their land is permanently preserved. As a further incentive to private landowners, the State has developed a capital gains proposal, which would authorize the exemption from state capital gains tax land transfers to the State. It would apply to land donated or sold to the State for open space or farmland preservation purposes and

would expire after three years of enactment. Over 14,750 acres in New Jersey have been donated to the State by landowners for open space preservation purposes since 1990.

New Jersey Preserved Recreation Land and Open Space*

Table 9

County	Federal Recreation Open Space Areas	Interstate and Regional Areas	State Parks, Forests, Recreation Areas, Natural Areas, Marinas & Historic Sites	State Wildlife Management Areas	New Jersey Natural Lands Trust	State Reservoir Sites	New Jersey Water Authority	State Conservation Easements**	State Miscellaneous Areas	State Subtotal	County Parks***	Municipal Parks***	Total Public Recreation Open Space
Atlantic	20,224		14,720	41,244	4,691			662	3,121	64,438	5,545	3,316	93,523
Bergen		2,452	3,243	208	10				0	3,461	8,216	5,088	19,217
Burlington	2,572		135,946	3,670	2,740			95	634	143,085	1,322	8,579	155,558
Camden			14,629	4,346	520				4	19,499	2,007	2,821	24,327
Cape May	10,705		20,764	24,764	236			2,633	5,314	53,711	2,045	4,442	70,903
Cumberland			6,391	63,413	143			385	1,138	71,470	165	2,354	73,989
Essex	21		156	0	2			240	56	454	6,001	2,338	8,814
Gloucester			0	7,189	418				78	7,685	1,578	3,821	13,084
Hudson	45		1,211	520	0				0	1,731	673	597	3,046
Hunterdon			7,229	3,431	770		108	878	1,910	14,326	3,906	5,080	23,312
Mercer			3,614	894	37			726	3	5,274	6,604	7,805	19,683
Middlesex			2,875	0	16	104		57	336	3,388	8,638	5,794	17,820
Monmouth	1,733		5,412	8,544	75		1,779	217	1,540	17,567	12,876	6,901	39,077
Morris	8,974		6,543	11,218	469	948		6,650	784	26,612	12,502	11,787	59,875
Ocean	22,184		29,770	64,941	2,387			465	2,006	99,569	5,231	6,207	133,191
Passaic	26		21,712	2,320	111			14,929	235	39,307	4,668	2,745	46,746
Salem	3,745		1,542	15,231	393			1,543	656	19,365	274	1,838	25,222
Somerset	188		2,333	0	19	3,611	152		405	6,520	9,065	6,801	22,574
Sussex	30,104		49,550	14,644	810	1,340		4,725	1,932	73,001	17	4,904	108,026
Union			1	0	0				0	1	6,554	1,391	7,946
Warren	9,151		15,831	7,936	478	181		992	1,052	26,470	1,473	3,038	40,132
Total Acreage	109,672	2,452	343,472	274,513	14,325	6,184	2,039	35,197	21,204	696,934	99,360	97,647	1,006,065

* Figures are as of January 1, 2003, except as noted in the footnotes below.

** Includes easements administered by the Division of Parks & Forestry, Division of Fish & Wildlife and the New Jersey Natural Lands Trust.

*** Based on inventories filed with Green Acres and a 2001 survey conducted of open space lands acquired by counties and municipalities as of January 1, 2001.

**** Based on a 2001 survey of nonprofit organizations to determine the amount of open space acquired by nonprofit conservation and recreation groups as of January 1, 2001 and supplemented by GIS mapped nonprofit open space information.

State Land Acquisition Project Process

In acquiring land for the State, Green Acres State Land Acquisition Program uses a nine step project process. The process is comprised of two elements, the first being the evaluation of lands for acquisition by the State and the second dealing with the administrative aspects of purchasing real estate.

Within the context of the Land Preservation Plan, evaluation refers to the process of reviewing and analyzing the natural, recreation and historic resource features of land in order to determine its relative value and importance when making land acquisition decisions. The evaluation system employed by the State provides an indication of various resource values of a parcel of land. It should be noted that Green Acres must also evaluate multiple parcels contained in a single project. While the evaluation process provides meaningful guidance to Green Acres on resource values, it can be difficult or misleading to compare different land types. Given the subjective nature of any evaluation process, comparing projects with different conservation and recreation resource values can be a challenge. Despite its small size, New Jersey displays tremendous geologic and geographic diversity, which is reflected in the parcels considered for State acquisition.

The nine step State Land Acquisition Project Process are listed and described below:

1. Garden State Preservation Trust Project Approval / Legislative Appropriation
2. Land Preservation Opportunity Identification
 - landowner offer application
 - targeted parcels
3. Project Evaluation
4. Divisions Review
5. Project Manager Assignment
6. Technical Work Ordered: Title, Appraisal, and Preliminary Assessment
7. Purchase Decision / Purchase Offer / Contract of Sale / Survey
8. Title Closing
9. Property assignment to managing Division

Step 1 - Project Approval/Funding: Project areas are submitted to the Garden State Preservation Trust for approval. Funding for the State Land Program is set by Garden State Preservation Trust Act at approximately \$60 million per year over the ten year life of the program. The New Jersey Legislature appropriates the project funds. Amounts for funding for each project area are based on a mix of policy initiatives, ongoing projects, funding demand, and land costs.

Step 2 - Project Identification: Project parcels are brought to the attention of Green Acres through a variety of means. Most commonly, a landowner will submit an offer application to sell real estate to the State. Typically, Green Acres receives over 200 offers a year from landowners statewide. Green Acres also targets land in a project area. Additionally lands are recommended for preservation by the Division of Fish and Wildlife, Division of the Parks and Forestry or the Natural Land Trust. Lands are also recommended by conservation organizations and other interested parties. The State also obtains land through landowner donations.

Step 3 - Project Evaluation: Land offers are first mapped in the Green Acres GIS where they are shown in relationship to existing preserved open space depicted on the Green Acres statewide open space map. Project parcels are then evaluated using the State Open Space Acquisition Priority System. The system may be found at the end of this chapter. The offers are evaluated according to the first 6 criteria, which is the GIS portion of the State Open Space Acquisition Priority System. Once the GIS analysis is completed, the offers are then submitted for agency review.

Step 4 – Division Review: The offers are circulated to the Division of Parks and Forestry, Division of Fish and Wildlife and the Natural Lands Trust to ascertain potential ownership and management interest. If an offering is of interest, then it will be further evaluated by the Green Acres Program using the State Open Space Acquisition Priority System. The combined point value derived from both evaluations will represent the final point score for project. Information on parcels, where there is no State interest, but may be of interest to local governments and conservation organizations are shared with these groups. Opportunities for cooperative management are explored as appropriate. Lands with high water resource values but have no expressed State interest will receive a second review to determine possible preservation alternatives. Targeted lands are also evaluated in the same manner.

Step 5 - Project Assignment: Once interest has been shown by an agency the project is assigned to a Green Acres project manager. Assignments are based on the geographic location of the property. Project management staff are organized into the following six teams:

Central Team: Hunterdon, Mercer, Middlesex and Monmouth counties

North East Team: Bergen, Morris, Passaic and Somerset counties

North West Team: Sussex and Warren counties

South Central Team: Atlantic, Burlington, Camden, Gloucester and Ocean counties

South Team: Cape May, Cumberland and Salem counties

Park Development and Urban Acquisition Team: Hudson, Essex and Union counties, statewide park development and acquisition in designated urban centers and communities.

These teams are responsible for state land, local government, and nonprofit project management. The project manager contacts the land owner to begin the state land acquisition process.

Step 6 - Technical Work: The project managers order title and two appraisals for properties with an estimated value in excess of \$250,000. Preliminary site assessment work to investigate previous land uses and the potential for hazardous waste concerns is preformed by Green Acres staff. Appraisals are reviewed by Green Acres appraisal staff to determine the fair market value of a property.

Step 7 - Purchase Decision / Purchase Offer: Upon the completion of Step 6, the project managers can continue the negotiation and make a purchase offer based upon satisfactory terms to the State and the property owner. Green Acres does not have the legal authority to use the State's power of eminent domain to condemn land for public conservation and recreation purposes. The State Land Acquisition Program can only acquire projects for such purposes from willing sellers. A contract of sale is prepared by a Deputy Attorney General upon the acceptance of the purchase offer by the property owner. At this time, a survey of the property is ordered and when completed reviewed by Green Acres survey staff.

Steps 8 and 9 - Closing and Property Assignment: After the survey review is completed, closing occurs between the Green Acres Program represented by a Deputy Attorney General and the property owner. After closing, the property is assigned to either Division of Parks and Forestry, Division of Fish and Wildlife, or the Natural Lands Trust for operation and management. In some cases, due to a lack of State interest, Green Acres may be assigned a property pending eventual transfer to a managing agency. In cooperative projects where state land acquisition funds were used, a local government or conservation organization may manage the land.

State Open Space Acquisition Priority System

This priority system for evaluating state land acquisition projects has been prepared in response to P.L. 2002, Chapter 76 which was signed into law by Governor James E. McGreevey on August 29, 2002. The Act, which amended the Garden State Preservation Trust Act, directed the Department of Environmental Protection to adopt guidelines for the evaluation and priority ranking of lands to be acquired by the State for recreation and conservation purposes using funds from the Garden State Preservation Trust or other sources. The Act specifically requires that the criteria for evaluating water resources protection value receive three times the weight and the criteria for assessing the importance toward protecting flood-prone areas twice the weight of the other criteria used to judge the relative merits of a potential state open space land acquisition project.

Under this proposed priority system for state open space acquisition projects, properties under consideration for state purchase will be evaluated under 11 factors. Each factor and sub-factor has been assigned a maximum number of points that can be assigned to a potential acquisition project. Point assignments are based upon the criteria presented under each factor and sub-factor, where appropriate. The total score derived by adding the points assigned under the various factors for a prospective acquisition project will be used as the basis for comparing the relative merits of the state acquiring individual properties for open space purposes

I. Groundwater Protection – 10 points maximum

A. Wellhead Protection for Community Water Supply - 2 points maximum

1. Information Source: New Jersey Geological Survey (NJGS) Wellhead Protection Area Coverage / NJDEP Geographical Information System (GIS)
2. Point Value Assignment:
 - a. Average Wellhead Protection Area (WHPA) value of the grid cells within the boundary of the property.
 - b. Maximum Point Value for Wellhead Protection:
 - (1). WHPA intersection of property – 2 grid cell points
 - (2). WHPA does not intersect property – 0 grid cell points

B. Groundwater Recharge Area Ranking by Watershed Management Area – 5 points maximum

1. Information Source: NJGS Groundwater Recharge Area Ranking by WMA Coverage / NJDEP GIS
2. Point Value Assignment:
 - a. Average groundwater recharge category value of grid cells within the boundary of the property.

- b. Maximum Point Value by WMA Recharge Capacity:
 - (1). Within a WMA, the area with the top third recharge capacities – 5 grid cell points
 - (2). Within a WMA, the area with the middle third recharge capacities – 3 grid cell points
 - (3). Within a WMA, the area with the lowest third recharge capacities – 1 grid cell point
 - (4). No identified recharge capacity – 0 grid cell points.

C. Aquifer Productivity Statewide – 3 points maximum

- 1. Information Source: NJGS Aquifer Productivity Coverage / NJGS GIS
- 2. Point Value Assignment:
 - a. Average aquifer productivity value of grid cells within the boundary of the property.
 - b. Maximum Point Value by Aquifer Productivity:
 - (1). A, B & C – 100+ gallons per minute (gpm) – 3 grid cell points
 - (2). D – 25 to 100 gpm – 2 grid cell points
 - (3). E – less than 25 gpm – 1 grid cell points
 - (4). No identified aquifer productivity – 0 grid cell points

II. Surface Water – 10 points maximum

A. Public Surface Water Supply Watersheds(intakes) – 3 points maximum

- 1. Information Source: NJDEP GIS
- 2. Point Value Assignment:
 - a. Average water supply value of grid cells within the boundary of the property.
 - b. Maximum Point Value by Proximity: Property is within 300' of water body used for public water supply purposes and:
 - (1). Within 1,500' upstream or 500'downstream(or to a downstream dam, if closer) of an existing public water supply intake – 3 grid cell points
 - (2). Located more than 1500' upstream of an existing public water supply intake – 2 grid cell point
 - (3). Located within watershed drainage of an existing public water supply intake – 1 grid cell points
 - (4). Outside drainage area – 0 grid cell points

B. Watershed Lands Draining to “Special Surface Water Resources *”
4 points maximum

1. Information Source: NJDEP GIS – HUC 14 coverage and Surface Water Quality Standards coverages
2. Point Value Assignment:
 - a. Average “special surface water resource” (SSWR) value of grid cells within the boundary of the property.
 - b. Maximum Point Value by Proximity:
 - (1). Protects lands within 300’ of SSWR segment and its upper tributaries within immediate watershed – 4 grid cell points
 - (2). Protects lands within the immediate watershed of a SSWR segment - 3 grid cell points
 - (3). Protects lands within the watershed directly above the immediate watershed of a SSWR segment – 2 grid cell point
 - (4). Protects land in all watersheds above criteria #3 – 1 grid cell point
 - (5) Land outside of SSWR drainage area – 0 grid cell Points

- Includes the surface waters within the Highlands and Pinelands regions, which have been recognized by the State as important water resource protection areas, and water bodies throughout the state that have been designated as Category One and Outstanding Natural Resource waters.

C. Surface Water Bodies – 1 points maximum

1. Information Source: NJDEP GIS
2. Point Value Assignment
 - a. Average water resource value of grid cells within the boundary of the property.
 - b. Maximum Point Value:
 - (1) Protects land within 300’ of water’s edge – 1 grid cell point
 - (2) Outside buffer area – 0 grid cell points

D. Planned Public Water Supply Facility Sites – 2 points

1. Information Source: State Water Supply Master Plan
2. Point Value Assignment:
 - a. Average planned public water supply value of grid cells within the boundary of the property.

- b. Maximum Point Value by Proximity:
 - (1). Property is wholly or partially within a planned public water supply facility site project area – 2 grid cell points
 - (2). Property is located within the watershed drainage of a planned public water supply facility site – 1 grid cell point
 - (3). Outside drainage area of water supply facility site – 0 cell points

III. Flood Prone Areas – 10 points maximum

A. Information Source: New Jersey Flood Hazard Maps augmented when necessary by FEMA Mapping / NJDEP GIS

B. Point Value Assignment

- 1. Points are assigned based on extent of occurrence within property:
 - a. Significant – 100% of point value
 - b. Limited – 50% of point value
 - c. Insignificant – 0
- 2. Maximum Point Value by Flood Prone Area
 - a. Flood Hazard Area (except Zone A areas)– 10 points
 - b. Zone A Area – 5 points

IV. Natural Resource Features - 10 points maximum; 5 points maximum per sub-factor

A. Freshwater and Saltwater Wetlands – 5 points maximum

- 1. Information Source: NJDEP Landuse/Landcover Wetlands GIS Coverage (300' buffers delineated)
- 2. Point Value Assignment:
 - a. Average wetlands value of grid cells within the boundary of the property.
 - b. Maximum Point Value:
 - (1). Wetlands present - 5 grid cell points
 - (2). No wetlands present - 0 grid cell points

B. Forests – 5 points maximum

- 1. Information Source: NJDEP Land Use/Land Cover GIS Coverage
- 2. Point Value Assignment:
 - a. Average forest value of grid cells within the boundary of the property.

- b. Maximum Point Value:
 - (1). Forests present - 5 grid cell points
 - (2). No forested area - 0 grid cell points

B. Additional Unique Resources (scenic views, old forests, exceptional wetlands) - 5 points maximum

- 1. Information Source: Offering applications, staff knowledge of site or site inspections.
- 2. Maximum of 5 points may be assigned based on rarity, quality and extent of occurrence of feature(s):
 - a. Significant – 100% of point value
 - b. Moderate – 50% of point value
 - c. Insignificant – 0

V. Fauna – Critical Habitat for Wildlife including Rare and Endangered Species - 10 points maximum

A. Information Source: F&W Landscape Project Coverage on NJDEP GIS

C. Point Value Assignment:

- 1. Average Fauna habitat value of grid cells within the boundary of the property.
- 2. Maximum Point Value by Critical Habitat Rank:
 - a. Federal Threatened and Endangered Species Habitat – 10 grid cell points
 - b. State Endangered Species Habitat – 8 grid cell points
 - c. State Threatened Species Habitat – 6 grid cell points
 - d. State Species of Concern Habitat – 4 grid cell points
 - e. Unconfirmed Suitable Habitat – 2 grid cell points

VI. Flora – 10 points maximum

A. Natural Heritage Priority Sites & Rare Flora or Natural Vegetative Communities(based on ONLM GIS mapped data) – 10 points maximum

- 1. Information Source: Natural Heritage Database on NJDEP's GIS.
- 2. Sub Factor Point Value Assignment:
 - a. Highest average value under either of the two sub factors presented below.
 - b. Maximum Point Value by GIS Analysis - 10 points
 - (1). Natural Heritage Priority Sites

- (a). Within Natural Heritage Priority Standard Site for flora ranked B1, B2, B3, or B4 – 10 grid cell points
 - (b). Within Natural Heritage Priority Standard Site for flora ranked B5, or Macrosite for flora ranked B1, B2, B3, B4 - 5 grid cell points
 - (c). Within Natural Heritage Priority Macrosite for flora ranked B5 – 2 grid cell points
 - (2). Rare Flora and Natural Vegetation Communities
 - (a). Contains viable occurrence for State Endangered Plant Species or for Plant Species of Concern or Rare Natural Community Ranked S1, G1 or G2. – 10 grid cell points
 - (b). Contains viable occurrence for Plant Species of Concern or rare natural community ranked S2 or G3 – 8 grid cell points
 - (c). Contains viable occurrence for Plant Species of concern or Rare Natural Community ranked S3 – 3 grid cell points
- B. Known Occurrence of Rare Flora or Natural Vegetative Communities (based on Natural Heritage Database occurrence records) – 10 points maximum
 - 1. Information Source: ONLM's file information and staff site knowledge.
 - 2. Sub Factor Point Value Assignment:
 - a. Known occurrence of Rare Flora or Natural Vegetative community.
 - b. Maximum Point Value based on occurrence - 10 points
 - (1). State Endangered Plant Species or Plant Species of Concern or Rare Natural Community ranked S1, G1 or G2 - 10 points
 - (2). Plant Species of Concern or Rare Natural Community ranked S2 or G3 - 8 points
 - (3). Plant Species of Concern or Rare Natural Community ranked S3 - 3 points
- C. Habitat for Rare Plants or Natural Vegetative Communities - 10 points maximum
 - 1. Information Source: ONLM staff 's evaluation of site suitability.
 - 2. Sub Factor Point Value Assignment:
 - a. Staff evaluation of habitat suitability of the subject property for Rare Flora and Natural Vegetative Communities known to exist in the vicinity of the property:

- (1). Significant - 100% of point value
- (2). Moderate - 50% of point value
- (3). Insignificant - 0

b. Maximum Point Values for habitat suitability by plant species and communities:

- (1). State Endangered Plant Species or Plant Species of Concern or Rare Natural Community ranked S1, G1 or G2 - up to 10 points
- (2). Plant Species of Concern or Rare Natural Community ranked S2 or G3 - up to 8 points
- (3). Plant Species of Concern or Rare Natural Community ranked S3 - up to 3 points

D. Factor Point Assignment: Highest value derived under sub factors A, B and C.

VII. Historic/Cultural Resources – 10 points maximum

- A. Information Source: Green Acres offerings applications and Historic Preservation Office's files
- B. Points are assigned based on the occurrence of a feature that meets one of the following criteria:
 1. Feature on or eligible for State and National Registers which are of statewide significance – 10 points
 2. Feature on or eligible for State and National Registers which are of local significance – 5 points
 3. No historic or cultural feature of significance - 0

VIII. Greenways/Trails/Preserved Open Space – 10 points maximum

- A. Information Source: Green Acres Open Space Planning Map
- C. Point Value Assignment
 1. Points awarded for each criteria are summed.
 2. Point assigned based on the extent to which a property:
 - a. Represents an integral component of a state existing or planned greenway, trail or project area; or connects to an existing preserved open space area – up to 3 points
 - b. Enhances a designated or proposed component of the State Trails System or a federal or state designated Wild, Scenic or Recreational River – up to 3 points
 - c. Contributes to the establishment of a greenbelt around an urban or suburban center – up to 2 points

- d. Acts as a physical or visual buffer between a sensitive area and development – up to 2 points

IX. Recreation Opportunities – 10 points maximum

A. Information Sources: Site characteristics, Green Acres Open Space Planning Map, municipal, county and regional park and open space master plans and site recreation master plan.

B. Point Value Assignment: Points are assigned up to the maximum of 10 points based on the following criteria:

1. Municipal Location – 3 points maximum
 - a. Urban Aid Community – 3 points
 - b. Urbanized municipalities with population densities equal to or greater than 5,000 people per square mile or gross populations equal to or greater than 35,000 people – 2 points
 - c. Municipalities with population densities less than 5,000 people per square mile or gross populations less than 35,000 people – 1 point
2. County Location – 3 points maximum
 - a. Heavily urbanized counties with population densities equal to or greater than 5,000 people per square mile – 3 points
 - b. Urbanized counties with population densities equal to or exceeding 1,000 people per square mile – 2 points
 - c. Counties with population densities less than 1,000 people per square mile – 1 point
3. Proximity to Existing State Open Space Areas with Similar Recreation Potential (If property is an integral component of a new state open space area being established, the entire park area is considered as the site under this factor.) – 3 points maximum
 - a. Located less than 10 miles from property - up to 3 points
 - b. Located more than 10 miles from property - up to 2 points
 - c. Located more than 20 miles from property - 1 point
4. Recreation Potential – 5 points maximum
 - a. Potential for a wide variety of outdoor recreation opportunities, many of which are not available in the county – up to 5 points
 - b. Potential for a limited number of recreation opportunities that are generally not available within the county – up to 3 points
 - c. Potential for recreation opportunities that are already generally available within the county – 1 point

X. Development Threat, Property Size and Acquisition Cost – 10 points maximum

A. Information Sources: Green Acres offering applications and Green Acres appraisal files

B. Point Value Assignment: Points are assigned up to the maximum of 10 points based on the following criteria:

1. Development Threat – 4 points maximum
 - a. Subdivision approval – up to 4 points
 - b. Pending subdivision application – 3 up to points
 - c. Includes developable land but a subdivision application has not been submitted – up to 2 points
 - d. Limited development permitted by state regulations – 1 point
 - e. No development permitted by state regulations – 0 points
2. Property Size – 4 points maximum
 - a. Over 100 acres - 4 points
 - b. 50 to 100 acres – 3 points
 - c. 25 up to 50 acres – 2 points
 - d. less than 25 acres – 1 point
3. Acquisition Cost – 2 points maximum
 - a. 25% or greater bargain sale – 2 points
 - b. less than 25% bargain sale or fair market value – 1 point

XI. Planning and Public Support – 10 points maximum

A. Planning – 8 points maximum

1. Information Sources: State Development and Redevelopment Plan, Smart Growth Policies, Garden State Preservation Trust Open Space Master Plan ,New Jersey Statewide Comprehensive Outdoor Recreation Plan, Garden State Greenways, Pinelands Comprehensive Management Plan and New York – New Jersey Highlands Regional Study
2. Point Value Assignment: Points are assigned based on consistency with the following plans:
 - a. State Development and Redevelopment Plan/Smart Growth Policies – up to 2 points
 - b. GSPT Open Space Master Plan/Water Supply Master Plan – up to 2 points
 - c. Pinelands Comprehensive Management Plan or New Jersey Highlands Regional Study – 1 point
 - d. Watershed Management Open Space Acquisition Plans – 1 point
 - e. Garden State Greenways – A Statewide Vision for Greenways and Open Space – 1 point

B. Public Support – 2 points maximum

1. Information Sources: Letters, newspaper articles and meetings

2. Point Value Assignment: Points are assigned based on the following criteria:
 - a. Project has attracted widespread support with little or no opposition – 2 points
 - b. Project has attracted local support with little or no opposition – 100% - 1 point
 - c. Projects that have attracted significant public opposition – 0 points

Final Scoring of Projects

The numerical values derived under the Water Resources Factors (#I & #II) will be multiplied by 3 to arrive at final point values. The points assigned under the Flood Prone Areas Factor (Factor #III) will be multiplied by 2 to arrive at a final point value. The point values derived under the other factors will represent the final factor point scores.

2005 - 2007 State Land Acquisition Projects

The following are projects that the State Land Acquisition Program will focus on over the next two years. The projects listed consist of projects that were approved for funding by the Garden State Preservation Trust in June 2002 and October 2003 and funding appropriated by the Legislature. These projects total \$120 million. Of this total, \$77.5 million is directed at protecting lands with important water resource values. An additional \$75 million was approved by the Trust in July 2004 and is awaiting funding approval by the Legislature. Included in these combined totals is funding for the Highlands, Pinelands, and Water Resource Lands categories of \$64 million reflecting the State's long term land preservation commitment to these areas. Water resources land acquisition projects account for 65% of state land acquisition project funding. The remaining State land funds are designated for projects such as Natural Areas. While the primary focus of these projects is not the protection of water resources, they do meet important conservation and recreation goals and provide for a balanced statewide public open space and recreation system.

Barnegat Bay Watershed - Monmouth and Ocean counties \$4,000,000

Barnegat Bay is one of the most widely used recreational resources in New Jersey, and its ecosystem is dependent on the preservation of coastal islands, wetlands, and uplands. Preservation of lands along the rivers and streams which feed it, will protect the Bay's water quality and continue the public use and enjoyment of this critical natural and recreational resource.

Cape May Peninsula - Cape May County \$6,500,000

Cape May is host to increasing numbers of tourists every year. This increase is due to the presence of Cape May Point State Park, Higbee Beach Wildlife Management Area, and the natural wonders that can be witnessed at these sites. Located on the Atlantic Flyway, both of these state facilities have drawn worldwide attention to the spectacle of the spring and fall bird migrations. Green Acres will continue its program of expanding Cape May Point State Park, Higbee Beach Wildlife Management Area, and other important areas to protect wildlife habitat and provide public access.

Crossroads of the American Revolution - Burlington, Hunterdon, Mercer, Middlesex, Monmouth, Morris and Somerset counties \$14,000,000

More Revolutionary War battles took place in New Jersey than in any other state. Remarkably, many vestiges of the Revolutionary War era still remain – mines, mills, soldier's footpaths, homes, encampment sites, and battlegrounds. While many of these sites are already preserved, many more can still be preserved. The basis of this project is to preserve land with a variety of partners which will help interpret New Jersey's role in the American Revolution.

Delaware and Raritan Canal - Hunterdon, Mercer, Middlesex and Somerset counties \$8,500,000

The Delaware and Raritan Canal State Park is a national recreation trail and a public water supply. It serves as a link between rolling countryside and urban areas. The park, as it exists now, is a relatively narrow strip along its 70 miles length. Green Acres and its preservation partners would like to widen the park and provide greater water

resource protection. One of the project initiatives is to create a system of greenways in the region.

Delaware Bay Watershed - Atlantic, Cape May, Cumberland, Gloucester and Salem counties **\$11,000,000**

The Delaware Bayshore is an area of global ecological significance: millions of shorebirds and thousands of raptors rely upon the area's habitat for their survival during migration. The fragile web of marine and terrestrial species can only be sustained through preservation of contiguous blocks of habitat. In addition, this region's economic base is greatly enhanced by the growing ecotourism industry that is directly linked to the preservation of the Bayshore's natural resources. The primary focus of this project is the protection of the major river corridors that drain into the Delaware Bay.

Delaware River Greenway - Burlington, Camden, Gloucester, Hunterdon, Mercer, Sussex, and Warren counties **\$14,000,000**

The Delaware River Valley is one of the most scenic areas of the Mid-Atlantic states. The river meanders along New Jersey's western border revealing dramatic palisades at the Delaware Water Gap, forested islands, valleys and historic villages. The Delaware River is also a major flyway for migratory birds. Efforts are underway to secure greater public access, increase public holdings and protect the natural and historic resources of the Delaware River and its tributaries.

Great Egg Harbor Watershed - Atlantic County **\$1,500,000**

The Great Egg Harbor River runs from Berlin Borough through the Pinelands to the Atlantic Ocean. It is the longest Pinelands River and a federally-designated Wild and Scenic River. The State is working to acquire and protect lands along the river outside of the Pinelands National Reserve to provide continuous public ownership of the river corridor. The State is seeking to preserve coastal estuarine lands which provides habitat for threatened and endangered species such as the least tern and the piping plover.

Harbor Estuary - Bergen, Hudson, Middlesex, Monmouth and Union counties **\$6,500,000**

The New York/New Jersey Harbor Estuary Program is a regional partnership of federal, state, and local agencies, and citizens, working to protect and restore the natural resources of the estuary. Lands along the Arthur Kill, Hudson River, Raritan Bay, and in the Hackensack Meadowlands are being considered for preservation.

Highlands - Bergen, Morris, Passaic and Sussex counties **\$45,000,000**

Sweeping across the north central portion of New Jersey, nearly one million acres of forests in the Highlands surround and protect the drinking water for millions of New Jersey's citizens. Serving as a spectacular green belt around some of the nation's most densely populated cities and suburbs, the majority of the Highlands' mountains, ridges, forests, and fields are privately held and vulnerable to development. Preservation of the Highlands is critical to protect New Jersey's water supplies and biodiversity.

Historic Resources - Statewide **\$3,000,000**

New Jersey is dedicated to protecting sites that have played a role in the history of the state and nation. The following are examples of the types of historic sites the State seeks to expand: Allaire State Park, Monmouth Battlefield, New Bridge Landing,

Princeton Battlefield, Proprietary House, Twin Lights, Washington Crossing State Park and Waterloo Village.

Musconetcong Watershed - Hunterdon, Morris, Sussex and Warren counties

\$1,000,000

Green Acres and the counties of Hunterdon, Morris, Sussex, and Warren have identified a number of sites along the Musconetcong and Pohatcong rivers for acquisition. The project is a cooperative effort between Green Acres, the Farmland Preservation Program, and the Musconetcong Watershed Association. The Musconetcong is one of New Jersey's most important trout waters. Preserving the water quality of these two rivers is a major goal of the project.

Natural Areas - Statewide

\$5,000,000

New Jersey's natural areas often protect threatened or endangered plant and animal species. Green Acres is committed to protecting these environmentally sensitive regions of New Jersey. Green Acres plans to expand dozens of Natural Areas throughout the state, ranging geographically from Woodbine Bogs in Cape May County, to Strawberry Hill in Mercer County, to Ramapo Lake Natural Area in Bergen and Passaic counties.

Nonprofit Camps - Statewide

\$3,500,000

Purchase of nonprofit camps, in both fee and easement, is a way to preserve existing recreation facilities that might be lost to development. The purchase of conservation easements will allow continued operation of the camp, while preserving the natural resource values of the land. In many cases, the camps are adjacent to, or complement, existing state holdings.

Pinelands - Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Ocean counties

\$13,000,000

The only nationally designated reserve of its kind in the country, the Pinelands harbor species found nowhere else in the world. Its sandy soils filter billions of gallons of rainfall into New Jersey's largest aquifer. Comprising one million acres, the majority of which are privately held, the Pinelands continue to offer important opportunities for land and resource preservation. Permanent protection of open space in the Pinelands will ensure excellent water quality, ecosystem integrity, sustainable agricultural production, and the continuance of recreation activities such as canoeing, hunting, and camping.

Raritan River Watershed - Hunterdon, Morris and Somerset counties

\$12,000,000

Portions of Hunterdon, Morris and Somerset counties are located within the watershed basin of the Raritan River, a suburban area of the state that is facing increasing development pressure. Green Acres will pursue land preservation efforts in the Raritan River watershed to protect biological diversity and water resources, including the Sourland Mountains, the largest contiguous wooded area in central New Jersey.

Ridge and Valley Greenway - Sussex and Warren counties

\$15,500,000

Bounded by the Highlands to the east and the uppermost reaches of Delaware River to the west, the Ridge and Valley region consists of the Kittatinny and Jenny Jump ridges and the valleys of the Paulinskill and Wallkill rivers. These are popular recreation areas offer amazing vistas and is traversed by the Appalachian Trail. The purchase of additional lands in this region will create linkages between publicly owned lands such as

the Delaware Water Gap National Recreational Area, Stokes State Forest, High Point State Park, Jenny Jump State Forest, and Bear Swamp Wildlife Management Area. These projects will increase public access and protect water resources in the watersheds of the Upper Delaware Paulinskill, Wallkill and Pequest rivers.

Trails - Burlington, Mercer, Monmouth, Ocean, Passaic, Sussex, and Warren counties **\$12,000,000**

The mission statement of the Green Acres Program includes the goal of establishing “an interconnected system of open spaces.” One of the reasons is that these connections allow people and wildlife to move between, public and private protected land. Preserving the scenic viewsheds along new and established trails is a high priority. Existing recreation trails can suffer problems of overuse and user conflicts. New Jersey realizes that it is in the public's best interest to purchase land to expand and protect single and multi-purpose recreation trails.

Urban Parks - Camden and Mercer counties **\$12,000,000**

Providing recreation opportunities in urban areas is a national priority. Urban public park open space and recreation areas have suffered from a lack of funding, maintenance and available land. Creating and enhancing public open space in urban areas improves the quality of life for urban residents and workers, can be an urban redevelopment catalyst and serves a critical role in controlling suburban sprawl. Recognizing the importance of urban parks, Green Acres will continue to acquire land in New Jersey's cities to expand and improve park and recreation opportunities.

Watershed Resource Lands - Hunterdon, Monmouth, Morris, Passaic and Sussex counties **\$6,000,000**

New Jersey has long recognized that it is critically important to protect the environmentally sensitive resources of stream corridors, lakes, reservoirs, wetlands, and aquifers. These lands protect both water quality and supply, provide recreation opportunities, and preserve biological diversity. Green Acres will continue to acquire lands that protect public water resources, wildlife habitat, and offer recreation opportunities throughout New Jersey.

FY 2005 State Land Development Projects

Public Law 2002, Chapter 76 requires that the open space plan identify areas of the State where the development of lands by the State for recreation and conservation purposes is likely to occur. In order to meet this requirement, the Green Acres Program consulted with the Division of Fish and Wildlife and the Division of Parks and Forestry to determine potential development projects. These two divisions are responsible for a wide array of facilities needed for the access, use, operation and management of the State's public open space and recreation areas. The Capital Improvement Plans for FY 2005 were reviewed to ascertain projects, locations and proposed costs. These projects represent more than \$66 million in capital project requests by the two divisions for FY 2005. The general locations of the projects are illustrated on Map 7.

DIVISION OF FISH AND WILDLIFE FY 2005 CAPITAL PROJECT PLAN

<u>Area/Project</u>	<u>Funding Request</u>
Assunpink Wildlife Management Area Boat Access	\$750,000
Barnegat Bay Natural Resource Educational Center Existing Structures	250,000
Bulkheads, Canal, Docks	150,000
Delaware Bay Natural Resource Education Center	600,000
Ken Lockwood Gorge Wildlife Management Area Road Improvement	650,000
Nacote Creek Natural Resource Education Center Boat Basin	500,000 500,000
Pequest Wildlife Management Area Natural Resource Education Center Trail Development	680,000 140,000
Sparta Mountain Wildlife Management Area Trail Development Sanitary Facility	50,000 35,000
Wildcat Ridge Wildlife Management Area Hawk Watch Splitrock Boat Ramp	100,000 375,000
Hackettstown Hatchery Exhibits	100,000

Rockport Game Farm Range Pens & Storage Buildings	310,000
Statewide Signage	60,000
Statewide Storage Buildings	285,000
Statewide ADA Facilities	100,000
Statewide Dam Repairs	3,215,000
Statewide Dredging	3,500,000
Statewide Roads, Bridges, Parking	1,360,000
Statewide Building Demolition	500,000
Total Funding Requested for Fish & Wildlife	\$14,210,000

**DIVISION OF PARKS AND FORESTRY
FY 2005 CAPITAL PROJECTS PLAN**

Recreational Development

<u>Area/Project</u>	<u>Funding Request</u>
Allaire State Park Overnight Development	\$250,000
Day Use Development	300,000
Allamuchy State Park Interpretive Facility	150,000
Belleplain State Forest Camping Facility	
Day Use Expansion	100,000
Cape May Point State Park Interpretive Center / Magnesite Development	900,000
D & R Canal State Park Design Guide	200,000
Double Trouble State Park Heritage Trail Visitor Center	600,000
Hopatcong State Park New Bathhouse Complex	150,000

Jenny Jump State Forest Day Use Improvements	150,000
Kittatinny Valley State Park Day Use Improvements	150,000
Long Pond Ironworks State Park Reservoir Sanitary Units	400,000
Ramapo State Forest Parking / Trailheads	200,000
Round Valley Recreation Area Day Use / Site Work	200,000
Spruce Run Recreation Area Day Use / Boating Improvements	150,000
Stokes State Forest Day Use Improvements	150,000
Camping Improvements	150,000
Stephens State Park Day Use Improvements	300,000
Swartswood State Park Overnight Development	150,000
Keens Mill Improvements	200,000
Voorhees State Park Day Use Development	150,000
Washington Crossing State Park Interpretive Center	500,000
Sanitary Faciltiy	200,000
Washington Rock Day Use Development	100,000
Wawayanda State Park Day Use Area / Interpretive / Camping	500,000
Statewide Trail System	500,000
Total Recreational Development for Parks & Forestry	\$6,800,000

Renovations & Rehabilitation

<u>Area / Project</u>	<u>Funding Request</u>
Statewide Demolition of Unused Structures	\$ 300,000
Statewide ADA Facilities Improvement	1,000,000
Statewide Dam Repairs – Class 2	2,500,000
Statewide Roads, Parking & Bridge Repairs	3,000,000
Statewide Health, Safety, Environmental Compliance	1,500,000
Allaire State Park Site Work	200,000
Buildings	500,000
Allamuchy State Park Site Work	200,000
Buildings	300,000
Bass River State Forest Camping Area	150,000
Site Work	250,000
Buildings	700,000
Barnegat State Park Site Work	250,000
Bellplain State Park Water Supply	1,000,000
Site Work	100,000
Buildings	100,000
Cheesequake State Park Site Works	150,000
Buildings	150,000
D & R Canal State Park Bull's Island	100,000
Buildings	500,000
Site Work	300,000
Double Trouble State Park Site Work	200,000

Forked River State Marina	
Bulkhead	400,000
Dredging	300,000
Hackelbarney State Park	
Building	200,000
High Point State Park	
Building	700,000
Sitework	100,000
Beamerville	500,000
Hopatcong State Park	
Landing Site Work	200,000
Day Use	200,000
Island Beach State Park	
Buildings	1,000,000
Site Work	150,000
Jenny Jump State Forest	
Buildings	100,000
Site Work	200,000
Kittatinney Valley State Park	
Buildings	250,000
Site Work	100,000
Leonardo State Marina	
Bulkhead	500,000
Buildings	100,000
Site Work	300,000
Long Pond State Park	
Site Work	50,000
Monmouth Battlefield	
Buildings	200,000
Buildings	200,000
Site Work	100,000
Parvin State Park	
Buildings	300,000
Site Work	200,000
Ringwood State Park	
Buildings	1,750,000
Site Work	250,000

Round Valley Recreational Area	
Buildings	200,000
Site Work	200,000
Spring Meadow Golf Course	
Upgrade Course Layout	300,000
Buildings	200,000
Spruce Run Recreation Area	
Buildings	400,000
Site Work	100,000
Stokes State Forest	
Buildings	300,000
Site Work	100,000
Stow Creek State Park	
Buildings	100,000
Site Work	100,000
Swartswood State Park	
Buildings	150,000
Site Work	150,000
Voorhees State Park	
Buildings	200,000
Site Work	100,000
Washington Crossing State Park	
Buildings	250,000
Site Work	300,000
Maintenance	250,000
Wawayanda State Park	
Buildings	350,000
Site Work	200,000
Wharton State Forest	
Buildings	500,000
Site Work	300,000
Worthington State Forest	
Buildings	200,000
Site Work	500,000
State Nursery	
Nursery Grounds	250,000
Buildings	250,000

Forest Fire Towers Structural Repairs	250,000
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Total Renovation & Rehabilitation for Parks & Forestry	\$28,000,000
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Special / Historic Development

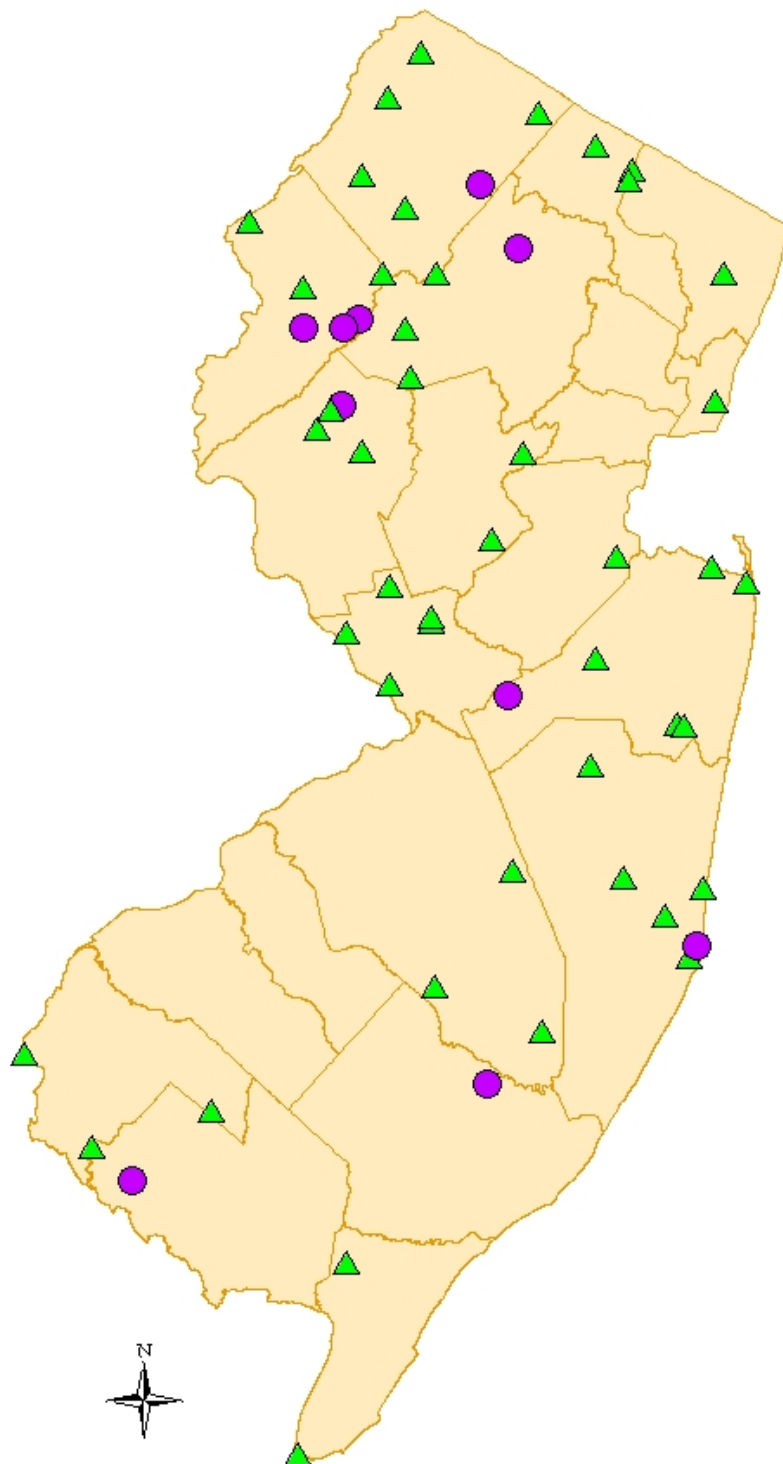
<u>Area/Project</u>	<u>Funding Request</u>
Allaire Village Buildings	\$600,000
Belleplain State Forest Somers Mansion	200,000
Byrne State Forest Walt Whitman House Complex	300,000
Cheesequake State Park Twin Lights	350,000
D & R Canal State Park Buildings	700,000
Tow Path	300,000
Double Trouble Village Buildings	100,000
Site Work	100,000
Drumthwacket Exterior	350,000
Fort Mott State Park Buildings	750,000
High Point State Park Monument Interior & Plaza	2,500,000
Hopatcong State Park Canal	100,000
Island Beach State Park Coast Guard Station 110	600,000
Liberty State Park Boxwood Hall	100,000
Terminal Complex	7,000,000

Train Sheds	2,000,000
Southern Waterfront Park	3,000,000
Liberty Walk Access	300,000
Ferry Slips	1,000,000
Long Pond Ironworks State Park Buildings	300,000
Monmouth Battlefield Visitor Center	300,000
Buildings	200,000
Battlefield Expansion	200,000
New Bridge Landing Site Work	300,000
Princeton Battlefield Buildings	250,000
Site Work	150,000
Ringwood State Park Ringwood and Skylands Manor	1,000,000
Six Mile Run State Park Buildings	500,000
Stow Creek State Park Wheaton House	100,000
Washington Crossing State Park Rockingham	2,000,000
Ferry House/Flag Museum	100,000
Trenton Battle Monument	50,000
Site Work	100,000
Nelson House	50,000
Waterloo Village Site Work	900,000
Building	300,000
Wawayanda State Park Double Pond Village	100,000
Barrett Farm	350,000
Wharton State Forest Atsion Mansion/Store	1,200,000
Batsto Mansion/Village	1,200,000

Historic Buildings Planning / Survey	100,000
Interpretive Displays	400,000
	<hr/>
Total Special/Historic for Parks & Forestry	\$ 17,200,000
Total Funding Request for Parks & Forestry	\$ 52,000,000
Total Funding Request for Fish & Wildlife	\$ 14,210,000
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Total Funding Requested	\$ 66,210,000

FY 2005 State Land Development Projects

Fish & Wildlife Projects 
Parks & Forestry Projects 



Prepared by Green Acres 2/10/05

Fish & Wildlife

Project	Funding
Assunpink WMA	750,000
Barnegat Bay Natural Resource Education Center	400,000
Delaware Bay Natural Resource Education Center	600,000
Ken Lockwood Gorge WMA	650,000
Nacote Creek Natural Resource Education Center	1,000,000
Pequest WMA	820,000
Sparta Mountain WMA	85,000
Wildcat Ridge WMA	475,000
Hackettstown Hatchery	100,000
Rockport Game Farm	310,000
Total	5,190,000

Statewide Projects

Signage, Storage Buildings, ADA Facilities, Dam Repairs, Roads, Bridges, Parking, Demolition	9,020,000
Total	14,210,000

Parks & Forestry

Project	Funding
Allaire SP	1,850,000
Allamuchy SP	650,000
Barnegat SP	250,000
Bass River SF	1,100,000
Belleplain SF	1,500,000
Byrne SF	300,000
Cape May Point SP	900,000
Cheesequake SP	650,000
D&R Canal SP	2,100,000
Double Trouble SP	1,000,000
Drumthwaet	350,000
Ferry House/Flag Museum/Trenton Battlefield	1,200,000
Forked River State Marina	700,000
Fort Mott SP	750,000
Hacklebarney SP	200,000
High Point SP	3,800,000
Hopatcong SP	650,000
Island Beach SP	1,750,000
Jenny Jump SF	450,000
Kittatinney Valley SP	500,000
Leonardo State Marina	900,000
Liberty SP	13,400,000
Long Pond Ironworks SP	750,000
Monmouth Battlefield	1,200,000
New Bridge Landing	300,000
Parvin SP	500,000
Princeton Battlefield	400,000
Ramapo SF	200,000
Ringwood SP	3,000,000
Round Valley Recreation Area	600,000
Six Mile Run SP	500,000
Spring Meadow Golf Course	500,000
Spruce Run Recreation Area	650,000
State Nursery	500,000
Stephens SP	650,000
Stokes SF	700,000
Stow Creek SP	200,000
Swartswood SP	300,000
Voorhees SP	300,000
Washington Crossing SP	3,800,000
Washington Rock	100,000
Waywayanda SP	1,500,000
Wharton SF	2,900,000
Worthington SF	700,000
Waterloo Village	1,200,000
Total	52,000,000

Statewide Projects

Trails, Demolition, ADA Facilities, Dam Repairs, Roads, Bridges, Parking, Fire Towers	9,050,000
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Total Funding Request 66,210,000

Statewide Water Resource Initiatives

During the preparation of this plan, several other plans and studies were consulted and reviewed to ensure that the State was undertaking a comprehensive approach in its water resource and open space planning. In addition, there are initiatives that are currently underway that will assist the State in its land preservation program.

Pinelands Permanent Land Protection Study Areas: The Pinelands Commission is studying regions of the Pinelands that retain Pinelands characteristics such as vegetation. To date the Study has identified the following areas and approximate acreages:

Southern Forest Area: 14,000 acres
Great Egg Harbor River Corridor: 35,000 acres
North - South Corridors: 25,000 acres
Headwaters: 35,500 acres
State Forest Extensions: 14,000 acres
Ocean County: 20,000 acres
Regional Growth Area Wildlife Corridors: 20,000 acres
Scenic Areas: 9,000 acres

Spruce Run Initiative: The New Jersey Water Supply Authority prepared this report together with local governments in the Spruce Run Watershed. The Initiative seeks to preserve critical areas within the watersheds that drain to the Spruce Run Reservoir, New Jersey's third largest water supply. A total of six project areas were identified with over 6,700 acres recommended for preservation. The project areas recommend for preservation by the Initiative:

Upper Spruce Run: 2,605 acres
Mt. Kemp: 761 acres
Spruce Run Reservoir Area: 809 acres
Musconetcong Mountain: 1,546 acres
Hoffman Farms Area: 350 acres
Mulhockaway Headwaters: 669 acres

New York - New Jersey Highlands Regional Study: This 2002 update provides a detailed analysis of the issues confronting the Highlands. The United States Forest Service identified six areas in the New Jersey Highlands as conservation focal areas that deserve special consideration for protection through land preservation or other means. These focal areas represent major land clusters and large contiguous tracts that are currently unprotected and have the highest conservation values.

Ramapo Mountains, Bergen County: There are major unprotected lands in high resource value zones surrounding the Wanaque Reservoir that would connect existing State and county parks and forests in these two heavily utilized recreational areas. This area ranked highly due to its water resources, biodiversity, and recreation values.

Wyanokie and Farny Highlands, Passaic and Bergen counties: There are major unprotected lands adjacent to Wanaque and Split Rock reservoirs that would connect existing State and county parks and forests. This area ranked highly due to its water resources and recreation, and secondarily for biodiversity, and forest land values.

Pequannock Watershed area in Morris, Passaic, Sussex counties: This critical watershed area serves as the core of the northern New Jersey Highlands and serves as a major hub connecting existing open space areas. Major gaps in conservation protection include areas adjacent to Sparta Mountain and the Farny Highlands. This area ranked highly due to its for water resource, forest land, biodiversity, and recreation values.

Sparta Mountain/Lubber's Run area, Morris and Sussex counties: The wooded ridges of Sparta Mountain and Lubbers Run valley provide an important greenway corridor connecting Mahlon Dickerson Reservation in the north and Allamuchy Mountain State Park in the south. Major gaps in conservation protection include the nearby area of Mase Mountain. This area ranked highly due to its productive forest land, biodiversity, and recreation values.

Upper Pohatcong/Pequest area in Warren County: These forested ridges and wetlands centered around the Pequest Wildlife Management Area serve as an important ground water recharge, wildlife habitat, and outdoor recreation area. This area ranked highly due to its water resources, recreation, forest and farm land values.

Scott Mountain/Musconetcong Ridge area, Warren and Hunterdon counties: These forest ridges and the neighboring productive farmland for a large contiguous area of high-quality rural landscape. This area ranked highly due to its for biodiversity, farmland, forest land and recreation values.

Highlands Coalition Critical Treasures: This coalition of several conservation organizations has identified nearly 352,000 acres in the New Jersey Highlands for preservation. Based on data from the Highlands Study and other sources, it recommends the following areas for preservation in addition to the sites identified by the Forest Service:

Hamburg Mountain, Sussex County: The biological and water resources of this area are important to preserve.

Wallkill River Area, Sussex County: Federally endangered bog turtle habitat in and near the Wallkill National Wildlife Refuge needs immediate protection.

Rockaway Watershed, Morris and Sussex Counties: The Rockaway River feeds Jersey's City's Boonton Reservoir and its in headwaters are located in Sparta Mountain and the Farny Highlands.

Upper Passaic River headwaters, Morris and Somerset Counties: The Passaic River rises in Leddell's Pond in Jockey Hollow National Historic Park, and heads south passing through the Great Swamp National Wildlife Refuge.

Upper North Branch Raritan River, Morris and Hunterdon counties: The Raritan River supplies the drinking water 1.2 million people in central New Jersey. Development of unprotected headwater areas could jeopardize this critical water supply source.

Pohatcong Grasslands and Mountain, Warren County: Over two-thirds of the Grasslands, a State Priority National Heritage Site, is home to numerous threatened and endangered species of birds and is under extreme development pressure, as is Pohatcong Mountain, which links the Delaware River bluffs with the Musconetcong Valley.

New Jersey Statewide Water Supply Plan: Work on the Statewide Water Supply Plan will continue concurrent with the implementation of the 2003-04 Water Supply Action Plan. Significant milestones that will be utilized in the Plan during 2004 are the development of Water Budgets and Ecological Flow Goals. The Plan includes the acquisition of the Kingston Quarry as a future reservoir site in the Raritan River Basin with a capacity of 14.2 billion gallons. The final Statewide Water Supply will be completed by December 2006.

2003-04 Water Supply Action Plan: As a part of water supply planning this plan identifies actions to be taken as a interim step in the ongoing of statewide water supply planning process. The plan identifies 11 actions to be undertaken by the State in response to the 2002 drought and emphasizes the need to refine its approach to managing regional water supply and demand. Actions include water supply construction projects, water supply studies in addition to acquisition and legislative initiatives.

New Jersey Clean Water Trust Fund: This proposed legislation would establish a New Jersey Clean Water Trust Fund, to be administered by the Department of Environmental Protection. The legislation will establish a stable funding source supported by two new user fees based on water consumption and water diversion to provide grant and loan funding to municipalities, counties and authorities for water resources and water quality projects. Projects which protect existing water supplies through land preservation, maintain existing public open space restoration, establish new water impoundment's, interconnect water supplies, and control flooding and provide the State match for federal projects funded pursuant to the "Water Resources Development Act" are among those eligible for funding pursuant to this bill. This bill would provide a stable and continuous source of funding for natural resource projects designed to protect the State's water resources.

Upper Delaware Watershed Management Project: This joint project between the North Jersey Resource Conservation and Development Council and the New Jersey Department of Environmental Protection developed criteria for water resource values that can be used for land preservation purposes. It created an evaluation system for the identification and ranking of lands that should be preserved because of their water resource values. This system utilizes GIS data to rank the water resource values of parcels in the watershed. The project identified over 9,000 acres of high value water resource lands in the Upper Delaware Watershed.

Passaic River Watershed Water Resource Values: Similar to the Upper Delaware Watershed effort, the project developed a system for evaluating and ranking lands for preservation based on water resource values. The geographic scope of this project is the Upper and Mid Passaic basins as well as the Pequannock, Pompton, Ramapa, Rockaway, Wanaque, and Whippany river basins. GIS data maps have been created that depict water resource values and indicate areas of preservation interest.

Cape May County Watershed Management Planning Program: This report identified areas in Cape May County for open space preservation. The following areas were recommended for preservation based on criteria, which included water resources:

Lower Township: This area is situated in central Lower Township south of the County Airport property. The area is of prime importance due to its location in the center of southern Cape May County. Developed sections east of this area do not have access to public water and rely on individual wells. Municipalities south of this area are suffering from salt water intrusion and intensely developed communities west of this area face potential salt water intrusion in those areas without public water supply.

Rio Grande/Wildwood: This area is significant because it contains the Wildwoods well field and some of the largest remaining undeveloped aquifer recharge areas. Preservation of the area would help maintain this public well field as well as the Rio Grande Swamp, and other sensitive areas. This area included portions of Green Creek, Dias Creek, and Fishing Creek.

Cape May Court House/North West Court House: This region has experienced significant development. There is need to preserve aquifer recharge areas west of Cape May Court House and along the Route 9 corridor. A large portion of the Bidwell's Creek watershed is included in the northern section, as well as significant portions of the headwaters of Crow Creek.

Swainton: This area includes some of the largest contiguous tracts of high quality aquifer recharge lands in the County. Located in the Route 9/Garden State Parkway corridor, preservation of these large tracts are a high priority.

Ocean View: This area along the Route 9 corridor has no public water or sewer, but is the site of several existing and proposed commercial/residential activities. The area contains significant aquifer recharge areas and surrounds all or portions of the Mill Creek, Sunk's Creek and Big Elder Creek watersheds.

Woodbine: Mostly farmland and regulated under the Pinelands Comprehensive Management Plan, this area has large aquifer recharge areas which could be of significant value in the future. It also contains portions of Cedar Swamp and large portions of the headwaters of Dennis Creek.

Maurice River: Located in Cumberland County and in extreme northern portion of the watershed, this area contains the largest undeveloped tract of upland in the region. It also contains the headwaters of East Creek and West Creek.

State Category One (C1) Waters: New Jersey has embarked on a program to increase the number of water bodies with the C1 designation. This designation is the highest form of water quality protection afforded by the State. It prevents any measurable deterioration in existing water quality, limiting development in parts and discharges to streams. The objective of C1 waters is to protect drinking water supplies, wildlife habitat, and recreation resources. The following waterbodies have been designated as C1 and representing of nearly 44,000 acres of reservoirs and 600 stream miles. The nine reservoirs provide drinking water to over 3.5 million residents, over 40 percent of New Jersey's population.

Designated C1 waters:

Round Valley Reservoir – Hunterdon County

Doughty Reservoir – Atlantic County

Oradell Reservoir – Bergen County

Charlottesburg Reservoir – Morris County

Boonton Reservoir – Morris County

Swimming River Reservoir – Morris County

Glendola Reservoir – Monmouth County

Manasquan Reservoir – Monmouth County

Wanaque Reservoir – Passaic County

South Branch Rockaway Creek – Hunterdon County

Sidney Brook – Hunterdon County

Flat Brook – Sussex County

Pequest River – Warren County

Assiscunk Creek – Burlington County

Beaver Brook – Hunterdon County

Marsh Bog Brook – Monmouth County

Bear Swamp Brook – Monmouth County

Squankum Brook – Monmouth County

Manasquan River – Monmouth County

Manasquan Reservoir – Tributaries – Monmouth County

Metedeconk River segments and its tributaries – Monmouth County

Mill Run – Monmouth County

Mingmahone Brook – Monmouth County

Muddy Ford Brook – Monmouth County

Timber Swamp Brook – Monmouth County

Metedeconk River, South Branch – Ocean County

Titmouse Brook – Ocean County

Hackensack River – Bergen County

Woodcliff Lake – Bergen County

Cresskill Brook – Bergen County

Lake Tappan – Bergen County

Pasack Brook – Bergen County

Wichechoeke Creek – Hunterdon County

Rockaway Creek South Branch – Hunterdon County

Lockatong Creek – Hunterdon County

Little Nishisakawick Creek – Hunterdon County

Harihokake Creek – Hunterdon County

Alexauken Creek – Hunterdon County

Lopatcong Creek – Hunterdon County

Pohatcong Creek – Warren County

Designated C1 Waterbodies based on Trout Populations

Bowers Brook – Warren County

Tunnel Brook – Warren County

Macopin River – Passaic County

Mill Brook – Morris County

Pequannock River – Morris and Passaic Counties

Wallace Brook – Morris County

Paulins Kill – Sussex County

Source Water Assessment Program (SWAP): Source water protection is a Environmental Agency program that requires all states to establish a SWAP. New Jersey's SWAP will be in place at the end of 2004 and consists the assessments of publics drinking water sources, potential contamination issues and public education. Contaminant source management includes zoning and land preservation. Information from the SWAP will provide the State and local governments the information necessary to protect drinking supplies.

Highlands Water Protection and Planning Act: This legislation passed in August 2004, created a 758,000 acre region divided into two segments, a 395,000 acre Preservation Area and a 363,000 acre Planning Area. Designed to protect water resources and other natural and recreation resources and manage growth, the Act establishes a Highlands Council that will prepare a regional master plan by June 2006 that will identify land preservation and smart growth opportunities.

Implementation Plan

The successful implementation of the policies of this plan depends on outlining a plan framework through which strategies can be formulated and orchestrated to advance New Jersey's open space and recreation program. The strategies presented here offer a basis for future direction. Given the constraints of limited funding and staff resources in the public and private sectors, the strategies are intended to maximize efforts to preserve in New Jersey's open space and protect natural resources.

State Land Acquisition Strategies:

These strategies guide the practices of the Green Acres program in the expenditure of funds allocated for State acquisition of land:

- **Willing Sellers:** Green Acres focuses its expenditure of funds on land owned by willing sellers.
- **Partnerships:** Green Acres seeks public and private sector partners for open space preservation projects.
- **State lands held by other agencies:** Green Acres works with other state agencies to identify and evaluate undeveloped lands that are held by other State agencies and which may be appropriate for preservation.
- **Geographic Information System:** Green Acres uses GIS technology for mapping, planning, data sharing, and the maintenance of a statewide open space map.
- **Preservation Tools:** Green Acres uses the full array of open space acquisition and preservation techniques including fee simple, easement, and development rights purchases, and donations.
- **Donations:** The State actively solicits land donations through the Natural Lands Trust and the Green Acres Program. The State engages the legal and nonprofit communities to increase the potential for donations, bargain sales, or gifts of value in land.
- **Federal Funding:** The State seeks federal funding such as the Land and Water Conservation Fund, Forest Legacy Fund, North America Wetlands Conservation Act, Coastal Wetlands Act, the Intermodal Surface Transportation Efficiency Act, and other funding sources which may become available. The State also supports other federal legislative open space and/or funding initiatives.
- **Planning:** The State coordinates its preservation and planning activities with federal and local governments, neighboring states, and the nonprofit community. The State encourages local governments to employ a variety of techniques for land preservation and recreational facility development in concert with sound land use and infrastructure planning. The State will continue to provide technical assistance in open space planning to local governments and nonprofit organizations.

- **Public Information:** The State publicizes its land acquisition efforts to increase public and private participation in open space preservation activities.

- **Targeting:** In addition to working from offers of sale from property owners, the State also targets properties for preservation in project areas for purchase from willing sellers

Strategies for State Assistance to Local Governments

These strategies are applied by the Green Acres Program to help local government's meet their individual open space objectives:

- **Funding Assistance:** The State will continue to provide Green Trust funding for county and municipal open space preservation and recreation projects.

- **Partnerships:** Green Acres develops cooperative open space projects with local governments in an effort to increase local government's participation in regional open space projects.

- **Technical Assistance:** Green Acres provides technical assistance for open space and recreation planning. Green Acres emphasizes master planning authority and encourages dedication of local funds for open space protection and park development.

- **Opportunities for Improvement:** Green Acres will continue to improve the Green Trust administrative processes to provide a higher level of service to its constituents and customers.

Strategies for State Assistance to Nonprofit Conservation Organizations

These strategies are applied by the Green Acres program to help nonprofit organizations meet their open space objectives:

- **Funding Assistance:** Green Acres will continue to provide funding for nonprofit open space preservation projects.

- **Partnerships:** Green Acres encourages nonprofit participation in regional open space projects and initiatives. It assists nonprofit organization in sharing information and expertise within the land preservation community.

- **Technical Assistance:** Green Acres provides technical assistance to nonprofit organizations for open space planning and preservation.

- **Negotiation/Acquisition:** Green Acres encourages nonprofit organizations to work with local governments and provide negotiation and acquisition assistance where prudent. Green Acres will continue to work with nonprofit organizations, which are willing to negotiate and/or acquire selected parcels of land on behalf of the State or local governments.

STATEWIDE IMPLEMENTATION STRATEGIES

- Focus open space preservation projects on protecting water resources and biodiversity. (NJDEP, local governments and conservation organizations)
- Support federal open space preservation projects at the National Wildlife Refuges in New Jersey. (United States Fish and Wildlife Service NJDEP, local governments, conservation organizations)
- Continue to evaluate the conservation and recreation potential of State owned lands such as hospitals and federal surplus lands. (NJDEP, State authorities and agencies)
- Continue the Green Acres Tax Exemption Program as a way to preserve private open space and recreation areas. (NJDEP, local governments, private providers)
- Seek the permanent protection of privately held watershed lands. (NJDEP, State Legislature, water companies)
- Continue the preservation of land for conservation and recreation purposes in urbanized counties by the State. (NJDEP)
- Continue to preserve important natural resource areas of the Pinelands. (NJDEP, Pinelands Commission)
- Focus Highlands protection efforts on lands identified in the Highlands Regional Study and by other conservation partners. (NJDEP, United States Forest Service, local governments, conservation organizations)
- Continue Green Acres funding for state land, local government and conservation organization acquisition projects for the Delaware Bayshore, Barnegat Bay Watershed and the Hudson-Raritan Estuary. (NJDEP)
- Continue to preserve and protect State Resource Areas through planning, regulation and acquisition efforts. (NJDEP, local governments, regional agencies, conservation organizations)
- Promote the use of **Garden State Greenways** by local governments, conservation organizations and the public. (NJDEP, New Jersey Conservation Foundation)
- Foster partnerships and cooperative projects between the State, local governments and conservation organizations. (NJDEP, local governments, conservation organizations, private landowners).

Appendix I

State Open Space Acquisition Priority System Evaluation Process GIS Analysis

Hundreds of parcels of land varying in size, shape, and complexity are offered to the Green Acres Program for purchase each year. These properties are evaluated based on environmental, recreational, and socioeconomic criteria established in the State Open Space Acquisition Priority System. Five of the 10 major factors are environmental components which will be evaluated using GIS technology because there exists corresponding statewide GIS datasets. The remaining 5 factors are not available in GIS format either because they do not have a geographic component or are currently unavailable on the GIS. Parcel evaluation and point assignment for these factors must rely on hardcopy maps, reports or other sources. Below is a brief description of the GIS Analysis used to evaluate potential state acquisition projects.

GIS Methodology Selection

Table 1 lists the major factors, sub factors and their detailed criteria developed in the priority system. Once the criteria was established, 16 DEP statewide, core data layers were identified which could link New Jersey's landscape with this detailed criteria. Next to each sub factor in the table is a number(s) referencing these original core GIS data layers. Their descriptions appear in Appendix II, Section 1.

From these core layers, a total of 27 individual base GIS data sets evolved that are needed to perform the evaluation. They appear in Appendix II, Section 2.

The complexity involved in evaluating a wide array of parcels against 27 individual data layers was a major time concern of the Green Acres Program. The evaluation process needed to be standardized and automated to insure consistent and efficient results. After looking into several GIS analysis approaches, ESRI Spatial Analyst software was selected for its GIS overlay analysis and zonal statistics. It allows extensive statewide data sets to be easily combined and valued resulting in a greatly reduced number of data layers from which to evaluate potential acquisition projects. From these combined data sets and subsequent point assignments, individual offers can be evaluated in the priority system quickly and consistently.

The Analysis Process

The original 16 core data layers and resultant 27 base data sets were created in vector format, where points, lines and polygons are used to represent landscape features. The resultant data layers were converted to raster data sets containing identically sized cells of 100 feet by 100 feet (approximately .23 acres). In raster conversion each cell is assigned a value which corresponds to the original vector landscape feature. When different landscape features fall inside the same grid the majority feature is recorded. For this reason, the smaller the grid cell, the better the actual representation of the landscape. However, in this analysis which utilizes extremely large statewide data sets,

Table 1. Appendix I Major Factors, Sub Factors, Detailed Criteria and Point Values in the Priority System

Major Factors	13 Sub-Factors	GIS Core Layer # used in Sub Factor Base Data Creation	Detailed Criteria for each Sub Factor reflected in Base Data Creation	Sub Factor Points	Max Points allowed per Major Factor
WATER-GROUND WATER	Wellhead Protection Area	#1	Land that falls within designated Well Head Protection Area (WHPA)	2.0	
		#1	Land that fall outside of designated WHPA	0	
	Ground Water Recharge	#2	Lands with highest recharge values per WMA	5.0	
		# 2	Lands with middle recharge values per WMA	3.0	
		# 2	Lands with lowest recharge values per WMA	1.0	
		# 2	Lands with no recharge value	0	
	Aquifer Productivity	# 3	Lands categorized as having A, B, C recharge productivity	3.0	
		# 3	Lands categorized with D values	2.0	
		# 3	Lands categorized with E values	1.0	
			Lands outside these areas	0	
					10
WATER-SURFACE WATER	Public Intake Protection	#5 - 8	Land within 300ft of water body used for public water supply but not more than 1500ft upstream or 500ft downstream of intake (maybe less than 500ft if dam exists above 500 ft limit).	3.0	
		#5,7,8	Land within 300ft of water body used for public water supply but more than 1500ft upstream from intake	2.0	
		# 5	Land anywhere within drainage system of public water supply intake	1.0	
		#5	Land not in any intake drainage	0	

Table 1. Appendix I Major Factors, Sub Factors, Detailed Criteria and Point Values in the Priority System

	Special Surface Water Resources	#7,8,9	Lands within 300ft of a "Special Surface Water Resource" (SSWR) or any upstream tributaries of a SSWR in the same "immediate" huc14.	4.0	
		# 9	Lands within " immediate" watershed of SSWR	3.0	
		# 10	Lands within watershed " directly above" SSWR watershed	2.0	
		# 10	Lands "above" previous watersheds	1.0	
		# 10	Lands outside of any SSWR drainage system	0	
	Water Body Protection	#7, 8	Lands within 300ft of any water body	1.0	
		#7,8	Land outside of 300 ft buffer areas	0	
	PPWSFSite	#11	Land within any proposed public water supply facility site (reservoir site or intake site)	2.0	
		#12	Land located upstream of proposed site	1.0	
		#11, 12	Land located outside of proposed site's drainage	0	
					10
FLOOD PRONE	FEMA -Flood Hazard	#13	Lands within a flood hazard zone, except Zone "A"	10.0	
		#13	Zone "A" lands inside flood hazard zone	5.0	
		#13	Lands outside of flood hazard zone	0	
					10
NATURAL RESOURCES	Wetlands	#8	Any wetlands or land within a 300 ft buffer of wetlands	5.0	
		#8	Land outside of wetlands or wetlands buffers	0	
	Forests	#8	Any forested lands	5.0	
		#8	Any non forested lands	0	
					10
FAUNA	Landscape Protection	#14	Any land identified as Federally Threatened & Endangered Species habitat	10	
		# 14	Land identified as State Endangered Species Habitat	8.0	
		# 14	Land identified as Threatened Species Habitat	6.0	

Table 1. Appendix I Major Factors, Sub Factors, Detailed Criteria and Point Values in the Priority System

		# 14	Land identified as State species of special concern	4.0	
		# 14	Land with no confirmed species but suitable habitat	2.0	
		# 14	Land meeting none of above criteria	0	
					10
FLORA	Natural Heritage Priority Site	#15	Land within standard sites for flora ranked B1, B2, B3 or B4	10	
		# 15	Lands within standard site for flora ranked B5, or macrosite ranked B1,B2,B3, B4	5.0	
		# 15	Lands within Macrosites for flora ranked B5	2.0	
		# 15	Lands that do not contain any of the above	0	
					10
			<u>or</u>		
	Rare Flora or Natural Communities	#16	Lands that contain viable occurrences of state endangered plant species or plant species of concern or rare natural communities ranked S1, G1 or G2	10.0	
		# 16	Lands that contain viable occurrences of state endangered plant species or plant species of concern or natural communities ranked S2 or G3	8.0	
		# 16	Lands that contain viable occurrences of state endangered plant.....ranked S3	3.0	
		# 16	Lands that do not contain viable occurrences of above ranks	0	
					10
					*10
* take higher of 2 values					

grid cells smaller than 100ft severely taxed the processing capabilities of the hardware.

Each cell was then re-assigned a point value that corresponded to that landscape condition/feature in the priority system. (See Sub Factor points listed in Table 1.) For example, all cells in a wellhead protection area are assigned the value of 1, and cells outside of the area are assigned a 0 value. This point assignment process was performed on each of the 27 data layers. See Table 2 for listing of 27 base raster grid files.

Various combinations of the 27 raster grids (or individual rasters by themselves) were used to generate 13 **sub factor** grids which correspond to the 13 sub factors listed in Table 1. See Table 2 for base raster grid combinations. While some of the base raster grids stood alone in the analysis such as the above example of well head protection areas (whpa), the creation of other sub factor grids were more involved. Some were merged to prevent double counting of features/criteria. For example, the 5 base grids associated with surface supply intakes were merged together to generate an intake sub factor grid. MERGE retains the top value in the raster combinations; cell values are not added together. The two potential public surface water facility sites grids, ppswfs and canal_drainage were also merged together to retain values. For additional raster creation and combination details see Appendix II, Section 2.

Once the 13 **sub factor** grids were created, the GIS “overlay analysis” was used to combine **sub factor** grids within each **major factor** to produce a **major factor grid** (refer to Table 2) . Most were simply added for a cumulative value. For example, the Natural Resources major factor is comprised of land that is categorized as wetlands/buffers or forest. The wetland cells valued at 5 were added to the forest cells also valued at 5 allowing for a result of 10 whenever both conditions were true. Other sub factor grids were added, but point values were re-set to maximum point values as determined in the priority system. (See Table 1 for maximum points allowed per major factor.)

Flora grids were combined by taking the higher of the two values. Only the original Flood Prone raster stood alone in the analysis. See Table 2 for sub factor raster combination methods and final grid composites for each major factor. These 6 final major factor grids are used to evaluate each of the potential state acquisition projects employing zonal statistics. For a more detailed description of the evolution of each of the GIS data sets used to create the final raster grids for the evaluation see Appendix II.

Zonal Statistics (for evaluation of individual properties)

Individual properties under consideration for purchase can now be assigned points using the zonal statistic “techniques” in Spatial Analyst. For each of the 6 major factor grids, the computer automatically sums and averages the point values of all cells in each property or “zone” and displays the values in a table. This analysis allows for any number of properties to be evaluated at one time. Additionally, any offer can be subdivided into smaller “zones” (non- contiguous lots) that can also have values computed. Once the average point values for each major factor are calculated, the results are added to a statewide database that stores individual point assignments by major factor for each property. Point values are rounded to the nearest tenth of a decimal. For the water resource criteria and flood prone areas, the 3 and 2 times the weight requirement by the Smith Bill are then calculated and stored in the database.

Once the remaining, non-GIS factors are evaluated, their point values are added to the table and then total points for the 5 GIS factors and 5 non-GIS factors are calculated and recorded for each offer. Table 3 shows the tally sheet for each potential acquisition property.

Conversion Options for Buffering

In order to insure maximum coverage/inclusion of features that are somewhat lost in the raster process, the following conversion “rules” were followed for lines and polygon coverages. Polygon features such as, water and wetlands were first buffered in ArcInfo than the buffers were rastered in Spatial Analyst. Line coverages employed Spatial Analyst’s “distance straight line” to buffer and create a raster file all in a one step calculation process.

Water Concerns

Since land activities directly adjacent to a water body can effect the health of a water body, a 300ft. buffer protecting watercourses is required in the priority system. In order to determine the placement of that buffer, the true width of the watercourse itself must be known. The statewide stream coverage (swqs) delineates only the centerline of streams throughout New Jersey. To give a more realistic geographic representation of the State’s streams, water polygons representing those streams were selected from the njlu95 core data layer using the attribute TYPE95 = water. In this coverage, rivers generally 80 ft wide or greater are delineated bank to bank. From a combination of these polygons and centerlines a 300-foot buffer (see buffering options above) was placed into grid format.

It was also determined that the 300 ft buffer area along the water feature, not the water body itself was the important environmental criteria in valuing properties in the priority system. Zonal statistics evaluates all the cells that fall within a given “zone” thereby assigning points to property based on the amount of water is misleading, for this reason, actual water polygons/cells are code as 0.

Table 2. Appendix 1

Grid Combinations for Zonal Statistics

Major Factors	27 Base Data Layers			How Combined	Resulting 13 Sub Factor Grids			How Combined	Resulting Major Factor Grids	Zonal Statistics (sum & averaging of points per property)	Smith Multiplier	
GROUND WATER	wellhead protection areas			N/A	whpa_R			ADDITION 10 point MAX			average points	
	ground water recharge			N/A	gwr123_R				ground_water			
	aquifer productivity			N/A	aquifer_R							
SURFACE WATER	surface water supply intake drainage		}	MERGE	intakes_R			ADDITION 10 point MAX			average points * 3	
	watercourse/buffers below 1500 ft											
	watercourse/buffers above 1500ft											
	water body buffers above 1500ft											
	water body buffers below 1500ft											
	water											
	special surface water resource (sswr)		}	MERGE	sswr_R					surface_water		average points
	sswr & tributaries (stream centerlines)											
	sswr & tributaries (water polygons)											
	water											
all water body buffer (polys)		}	MERGE	all_water_R								
all watercourses/buffers (lines)												
potential surface water facility sites		}	MERGE	ppswfs_R								
D&R canal drainage												
FLOOD PRONE	flood prone areas			N/A	fema_R			just renamed	flood_prone	average points	average points * 2	
NATURAL RESOURCES	wetlands & buffers			N/A	wetbuff_R			ADDITION 10 point MAX	nat_res	average points	average points * 1	
	forests			N/A	forest_R							
FAUNA	wetlands *		}	ADDITION 10 Point MAX			}	just renamed	fauna	average points	average points * 1	
	forest*											
	emergent wetlands*				landscape_R							
	beach*											
forested wetlands*												
FLORA	Natural Heritage Priority Sites			N/A	ga_nhpsites_R			Higher Value	flora	average points	average points * 1	
	Rare Flora & Natural Communities			N/A	nhpgrid_R							
	* Landscape Data											

Table 3. Appendix 1
Tally Sheet of Rank Points for Each Potential State Acquisition

Point Rankings for Individual Sites in Each Potential Acquisition Property

Offer# _____
Offer_acres _____
Site# _____
Site_acres _____

Total Ground Water Points _____
Total Surface Water Points _____
Total Water Points _____
Weighted Water Points (*3) _____

Flood Prone Points _____
Weighted Flood Prone Points (*2) _____

Total Natural Resource Points _____
Total Fauna Points _____
Total Flora Points _____

Total Historic Resource Points _____
Total Open Space Linkage Points _____
Recreation Points _____
Cost/Dev Threat Points _____
Planning & Support Points _____

Total Site Points _____

Appendix II

Section 1

Description of Core GIS Data Layers Used in State Open Space Acquisition Priority System

New Jersey Department of Environmental Protection has numerous statewide data layers available in Geographic Information Systems (GIS) format. Sixteen core GIS data layers were identified that portray the major factor criteria of water, flood, natural resources, fauna and flora established in the State Open Space Acquisition Priority System. From these core data layers, twenty seven base data sets evolved that were rastered and combined to be used in the priority system evaluation process. (See Section 2 for details regarding their creation).

Below is a brief description of each core GIS layer. Use Table 1, Appendix I to identify the core layers used in the sub factor/ base data creation.

GIS Core Data Layers

- # 1 Title: New Jersey Public Community Water Supply Well Head Protection Areas
Name: njwhpa
Originator: NJDEP NJGS
Publication Date: June 2002
Scale: 1: 24,000

Statewide polygon coverage of well head protection areas (whpa). Whpa are comprised of tiers that show the horizontal extent of ground water captured by public community wells pumping at a specific rate over 2, 5, 12 year periods for confined wells. Unconfined wells have a 50 ft radius delineated around them and serve as the whpa to be controlled by the purveyor.

- # 2 Title: In-house data
Name: gwr123
Originator: NJDEP New Jersey Geological Survey (NJGS)
Publication Date: not publicly available
Scale 1: 24,000

New Jersey has 20 individual watershed management areas (wma). There is a separate groundwater layer for each wma. Layers were generated by combining land use/ land cover, soil and municipality-based climatic data. These polygon layers contain estimated average annual ground water recharge in inches per year.

Note that due to incomplete soil and land cover data in Essex and Hudson counties, portions of the resulting groundwater layers in wma 04, 05, 06 and 07 also have no data.

For the priority system, NJGS grouped the recharge volumes into thirds based on % contribution to total recharge amounts in each wma. Areas providing the greatest 33% of recharge on a volumetric basis become category 1. Category 2 is the middle third and 3 the lowest. This break down allows areas contributing the most to the total recharge of each wma to be highlighted. The individual wma coverages were appended together resulting in a new file gwr123.

3 Title : In-house data
Name: aquifer
Originator: NJDEP New Jersey Geological Survey (NJGS)
Publication Date: not publicly available
Scale:1:24,000

The aquifer productivity data layer covers all of New Jersey counties except Essex and Hudson counties where data was incomplete. Using various sources of geophysical data, NJGS has developed a ranking system for aquifers, based on an aquifer's ability to supply water. Aquifers are ranked based on the median yield of high capacity wells in gallons per minute. Polygons are coded with the following ranks and ranges: A > 500, B = 251 to 500, C = 101 to 250, D = 25 to 100 and E < 25.

4 Title: New Jersey Surface Water Source Areas for Public Potable Water
Supply Surface Water Intakes
Name: njswap_14
Originator: NJDEP Division of Land use Management, Water Supply
Administration
Publication Date: not publicly available
Scale: 1: 24,000

Statewide compilation of all source water areas (SWA) that contribute surface water to drinking supplies in NJ. The entire upstream drainage system (headwaters and all tributaries that eventually flow into a surface water intake and land areas that contribute to overland flow) defines a SWA. Most SWA are comprised of entire huc14s, in some instances basins smaller than huc14s were delineated by WSA. Note: With regard to the Delaware River intakes, upstream basins above a 25 hour time of travel determination were removed from the delineation. For the purposes of the Source Water Assessment Program (SWAP), the sheer size of the Delaware River drainage basin combined with the large portions in the neighboring states, compelled SWAP to break the basin into more manageable size for susceptibility models. It was felt any density type variables would be skewed with such a large area. There also existed an uncertainty as to what data might be available and the compatibility of data from surrounding states.

- # 5 Title: NJDEP New Jersey Potable Surface Water Intakes
Name: swint_02c
Originator: NJDEP Division of Land Use Management, Water Supply
Administration
Publication: not publicly available
Scale: N/A Horizontal coordinates were collected with a Trimble Pro XR
GPS Unit.)

Point coverage showing geographic location of all public potable water supply surface water intakes in NJ (i.e., public potable supply surface water intake structures and public community supply wells which are under the direct influence of surface water). Intake points only used as reference points in the Priority System.

- # 6 Title: NJ DEP Dams for the State of New Jersey
Name: dams.shp
Originator: NJDEP Dam Safety Section
Publication Date: May 2000
Scale: 1:12000

Statewide point coverage locating high, significant, low and unclassified hazard dams. This file used only as a reference file.

- # 7 Title: NJDEP Surface Water Quality Standards of New Jersey (NJSWQS)
Name: swqs.shp
Originator: NJDEP Division of Land Use Management, Bureau of Fresh
Water and Biological Monitoring
Publication Date: July, 2004
Scale: 1: 24,000

Statewide data layer (lines only) of hydrologic stream network of NJ. Main purpose is to provide digital representation of New Jersey Surface Water Quality Standards for all New Jersey streams. Original source was USGS 1:24000 DLG files. Individual arcs are coded with the surface water quality standard designations. Used this file to identify "Special Surface Water Resources" - Category One Waters ,Outstanding Natural Resource Waters, and Pinelands and Highlands watercourse segments.

- # 8 Title: NJDEP 1995/97 Land Use/Land Cover Update (by watershed
management area)
Name: njlu95.shp / water.shp, wet95d.shp, njlu95forest.shp
Originator: DEP/Bureau of Geographic Information Analysis (BGIA) /
Office of Information Resources Management
Publication Date: December 2000
Scale: 1: 12,000

Individual WMA coverages were appended together by BGIA to create a statewide polygon coverage identifying all of New Jersey's land by its use and cover types (i.e. agriculture, wetlands). To isolate three cover types needed for the priority system BGIA reselected on TYPE95 for water, wetlands and forest creating three interim files.

- # 9 Title: NJDEP Stormwater Rule Areas Affected by 300 foot Buffers
Name: strmwtrupc1.shp
Originator: Division of Land Use Management, Bureau of Fresh Water &
Biological Monitoring
Publication Date: August, 2004
Scale: 1:24,000

DEP statewide coverage designed to assist in determining if properties are located in an area that may be subject to new NJDEP stormwater rules. Coverage delineates sub-drainage basins (huc14s) or portions of huc14s that contain C1 segments and their upper tributaries that reside in same huc14. When portions of huc14 appear not to be subject to stormwater rules, smaller basins were delineated around the C1 and upper tributaries using 10M DEM of NJ, USGS topoquads and swqs.shp. These hucs were used to determine the "immediate" watersheds of C1 waters (one component of the Special Surface Water Resources Waters referenced in the criteria 2B2).

- # 10 Title: NJDEP 14 Digit Hydrologic Unit Code Delineation for New Jersey
Name: dephuc14.shp
Originator: NJDEP NJGS
Publication Date: April 2000
Scale: 1:24,000

Statewide coverage delineating the boundaries of the basins with a fourteen digit hydrologic unit code (huc14). These are smallest drainage basin units mapped in New Jersey. Reassembled from United States Geological Survey HUC14 hydrologic unit. Units have a defined minimum size of 3000 acres though some are smaller. Used this file to capture all hucs identified in the "Special Surface Water Resource" criteria.

- # 11 Title: Planned Public Water Supply Facility Sites
Name: ppwsfs.shp
Originator: NJDEP Green Acres Program
Publication Date: not publicly available
Scale: 1:12,000

Based on conversations with DEP staff in Water Supply Planning, these lands have either been purchased several decades ago or identified for purchase in the future, and are most certain to evolve into actual water supply sites. The shapefile contains lots and blocks of these sites as defined on in-house project files or coverages. The current ownership status of some lots in the designated project areas are unclear, so all lots

present in the file were coded as potential sites. Naturally, ones that may already be owned by the State will not come up for evaluation.

12 Title: In house data
Name: canal_bsn.e00
Originator: NJDEP Division of Land Use Management, Water Supply
Administration
Publication Date: not publicly available
Scale: 1: 24,000

This coverage contains the drainage basins that are influent to the Delaware and Raritan Canal.

13 Title: Q3 Flood Data, each county, New Jersey
Name: atlfema, berfema, etc
Originator: FEMA (Federal Emergency Management Agency)
Publication Date: 1996
Scale: 1:2,400

Q3 data derived from Flood Insurance Rate Maps (FIRMS), intends to provide users automated flood risk data that may be used to locate special flood hazard areas (SFHA). Areas inundated by the base (1% annual chance) flood are designated as SFHA. They are identified on the FIRM as Zones A, AE, AH, AO, AR, A1-30, A99, V, VE, and V1-30. All zones were determined by detailed hydraulic analysis, except for Zone A areas which were determined by approximate methods.

The best mapping of flood prone areas in New Jersey is not available on the GIS. It was prepared and is available in hard copy by NJDEP/ Bureau of Floodplain Management. Sources in the Bureau suggest using the FEMA data layer for scoring when no flood plain management hard copy maps exist for a specific evaluation site/offer.

14 Title: Landscape Project, Version 2
Name: emergent.shp, forest.shp, wetlandforest.shp, wetland.shp,
grassland.shp
Originator: NJDEP/Division Fish and Wildlife / Endangered Non Game
Species Program (ENSP)
Publication Date: February 2004
Scale: 12,000

Landscape Project data, Version 2 used to identify critical habitat for imperiled and priority wildlife species in NJ. There are five separate shapefiles, one for each major habitat type in New Jersey (forests, forested wetlands, emergent wetlands, grasslands and beaches) which classifies critical habitat patches based on the conservation status of species present.

15 Title: NJDEP Natural Heritage Priority Sites
Name: prisites.shp
Originator: NJDEP/Division Parks & Forestry & Office of Natural Lands
Management (ONLM)
Publication Date: September 2001
Scale: 1:24,000

Statewide polygon file that identifies the best remaining habitat for rare species and exemplary natural communities in the state. These areas are considered top priorities for preservation of biological diversity in New Jersey. Each site is ranked according to significance for biological diversity using a scale developed by The Nature Conservancy. Scale ranges from B1 –B5. B1 –B3 sites are of global significance, B4 and B5 of state significance. Each site is also categorized by size. Standard Site are less than 3200 acres, Macro sites are greater than 3200 acres.

16 Title: NJDEP Natural Heritage Grid Map
Originator: NJDEP/Division Parks & Forestry & Office of Natural Lands
Management (ONLM)
Name: nhpgrid.shp
Publication Date: December 2002
Scale: 1:24,000

Nhpgrid.shp provides a general portrayal of the geographic locations of rare plant species and natural communities for the entire State of New Jersey. The state is divided up into computer generated grid cells, each being 358 – 372 acres in size. Cells are coded as to the location of a rare plant species and natural communities (i.e, contain species with precisely known locations, less precisely known locations, both types of locational status, or no recorded locations). If a rare plant species or natural community has been documented anywhere in cell, the entire cell is coded as containing an occurrence. In an accompanying database each occurrence is ranked according to its global or state rarity as defined by TNC.

Section 2

Development of Base Data Sets Used in Priority System

This section is organized by the major factors of the priority system as listed in Table 1 for Appendix I. Each major factor is broken down into its subsequent subfactors. Listed under each subfactor is the core data layer utilized to create the ensuing subsets and raster files. This is followed by a description of the processes/steps taken to create the raster grids needed to perform the zonal statistics evaluation on each potential acquisition. Calculations are written out at the end of each subfactor where a combination of grids where needed to satisfy the requirements of the priority system.

(Table 2, Appendix I lists the 27 base data sets and illustrates how they were combined for the evaluation.)

I. WATER RESOURCES

A. Ground Water Resources

1. Well Head Protection Areas

GIS Core Data Layer # 1
Name: njwhpa
Subset: njhwpal_fill.shp
Raster file: whpa_R

For the Priority System, all tiers are given the same point values; interior tiers were dissolved into a single polygon and a new shapefile created. The shapefile was converted to a raster grid. Cells inside whpa valued at 2 pt; cells outside of whpa valued at 0.

2. Aquifer Productivity

GIS Core Data Layer #2
Name: aquifer
Subset: none
Raster Files: aquifer_R

Aquifer polygon shapefile converted to raster and grid values set to aquifer RANKS in the attribute table. Raster cells values were reclassified as follows; A, B and C = 3.0, D = 2.0, E = 1.0 and No Data = 0.

3. Ground Water Recharge

GIS Core Data Layer # 3
Name: gwr123
Subset: none
Raster File: gwr123_R

NJGS rasterized the coverage using priority system values for greatest 33% recharge = 5.0, middle 33% = 3.0 and lowest 33% = 1.0.

B. Surface Water Resources

1. Surface Water Supply Intakes

GIS Core Data Layer # 4
Name: njswap_14
Subset: clip_swap_14D
Raster file: intake_drn

For this analysis, the SWA polygons for the non-community intakes were removed and the resultant intake drainage layer was converted to a raster grid. Cells inside drainage area were coded 1.0, cells outside coded 0.

GIS Core Data Layer # 5

Name: swint_02c – used only as a reference file in
creating sub-set file

Subset: intakes_pub_comm

Raster files: no raster file generated

Criteria was established to protect surface waters immediately surrounding intakes, i.e., 300 ft buffer on both sides of watercourse segments that are 1500 ft upstream and 500 ft downstream of an intake. Intake point locations in this file were needed to determine these criteria established dimensions/limits so buffering could take place.

Not all intake points were utilized. Selected only those intakes having their own Source Water Areas (SWA) or being associated with other SWA delineations as presented in njswap_14 coverage above. Removed all non-community intakes which in this instance only supply drinking water to factories/companies (BASF, DuPont Chamber Works & Hoffmann La Roche).

GIS Core Data Layer # 6

Name: dams.shp - used only as a reference file in
creating sub-sets (swqs.shp and water.shp)

Subset: none

Raster file: no raster file generated

Dams prevent water and pollutants from circulating back upstream to an intake. Therefore, if a dam exists anywhere between the intake and the 500 ft downstream limit, dam points were used to shorten the downstream extent of the watercourse segments needed to be buffered.

GIS Core Data Layer # 7

Name: swqs.shp

Subsets: watercourses above 1500 ft of intake
(wc_above1500), watercourses within 1500ft
above and 500 ft below range of intake
(wc_below1500)

Raster files: wc_below, wc_above

This file was used to capture watercourse segments described in the surface water criteria. The swqs line file was clipped with the intake drainage subset clip_swap_14D. The lines were manually measured and trimmed 1500 ft upstream and 500 ft downstream of each intake (intakes_pub_comm). When a dam existed above the 500 ft downstream limit the dam file was used to trim the downstream extent. This trimming created two files, one containing streams within 1500 ft above to 500 ft below an intake and those above 1500 ft of an intake. Both files were buffered and coded appropriately:

buffers on streams within the range of 1500 ft above to 500 ft below = 3.0, buffers on streams greater than 1500 ft above intake = 2.0.

GIS Core Data Layer # 8
Name: njlu95.shp / water.shp
Subset: water_above 1500,
water_below 1500
Raster files: water_0, water_below,
Water_above

All polygons using attribute TYPE95 = water were reselected from njlu95 creating water.shp. This file was put into grid format with water cells valued at 0 (water_0).

The water.shp was also clipped with the intake drainage subset clip_swap_14D. The polygons not connected to actual intake streams and tributaries were removed. Repeated manual process on the water bodies, in the same manner as the watercourses above, generated two files, one containing water within 1500 ft above to 500 ft below an intake and those above 1500 ft of an intake. Polygons were buffered and converted to rasters; coded cells within the range of 1500 ft above and 500 ft below = 3.0, above 1500ft = 2.0. Note: when intakes on large reservoirs have the 1500 ft upstream limit fall inside the reservoir, a 1500 ft buffer circle is generated around the intake. Shorelines falling inside the circle were selected and added to the water_below 1500 file, those upstream of circle are reselected above 1500 file.

See Conversion Options for Buffering and Water Concerns sections in Appendix II.

Raster combination process for intakes data layers

All 5 rasters were combined using the merge calculation in the raster calculator to generate a single intake raster grid.

Intakes_R = merge (water_0, water_below, wc_below,
water_above, wc_above, intake_drn)

Merge retains the top most raster values therefore the results are as follows for water courses, water bodies and drainage areas that are within the #4 njswap_14:

All water courses and water bodies = 0

Water Source Areas = 1.0

Buffers around water courses and water bodies above 1500 ft of an intake = 2.0

Buffers around water courses and water bodies that fall between 1500 ft above and 500 ft below an intake (except if a dam is located within 500 ft downstream of an intake) = 3.0

2. Special Surface Water Resources

GIS Core Data Layer # 10

Name: dephuc14.shp

Subsets: sswr_drainage, upper_sswr_drainage

Raster files: sswr_drainage

This layer was used in conjunction with swqs and C1_drainage files below ,and the Pinelands and Highlands boundaries to identify all watersheds (huc14) that contain “special surface water resources” (sswr), specifically– all C1, ON, Highlands and Pinelands waterways. These huc14 watersheds were selected to create the sswr_drainage file. This core layer was also used to create the upper_sswr_drainage file which contains hucs that are upstream of the sswr hucs. The C1_drainage, sswr_drainage and upper_sswr_drainage files were combined to create the raster file, sswr_drainage.

All cells were coded appropriately: Immediate hucs = 3.0 pts, directly above hucs = 2.0 pts , above directly above hucs = 1.0 pt. (See criteria 2B in priority system).

GIS Core Data Layers # 9

Name: strmwtrupc1.shp

Subsets: C1_drainage,

Raster files: no raster file created

Used this layer to delineate all statewide huc14 watersheds that contain C1 waters. C1 waters are deemed a component of the “special surface water resources” mentioned above. These hucs were subsequently appended to sswr_drainage above.

GIS Core Data Layer # 7

Name: swqs.shp

Subset: clip_sswr

Raster file: wc_sswr_trib

Swqs.shp was clipped to immediate hucs in sswr_drainage to identify all potential SSWR segments and upper tributaries. Watercourse segments downstream of any SSWR were then manually deleted Remaining segments used to create clip_sswr. Clip_sswr rastered to a 300 ft buffer and buffer cells were coded as 4.0.

GIS Core Data Layer # 8

Name: njlu95.shp / water.shp

Subset: water_sswr_tribs

Raster file: wtr_sswr_trib

Used in SSWR criteria to provide more realistic depiction of the widths of SSWR and their upstream tributaries.

Clipped water.shp with immediate hucs in sswr_drainage. Retained only those polygons that intersected with watercourse segments in clip_sswr.shp. Resulting water polygons renamed water_sswr_tribs and were buffered 300 ft in Arc. Buffers were converted to a raster grid, buffers coded 4.0 and interior water cells were coded as 0.

Raster combination process for SSWR data layers

To generate a final SSWR grid, 4 rasters were combined using the “Merge” calculation in the raster calculator.

$$\text{sswr_R} = \text{Merge}(\text{water_0}, \text{wtr_sswr_trib}, \text{wc_sswr_trib}, \text{sswr_drainage})$$

Merge retains the top most raster values, therefore the results are as follows for water courses, water bodies and drainage areas that are within the “immediate”, “directly above” or “above” categories of the basin’s proximity to a SSWR:

All water courses and water bodies = 0
Drainage area “above” an “immediate” = 1.0
Drainage area “directly above” and “immediate” = 2.0
An “immediate” drainage area of a C1= 3.0
Buffers around water courses that fall within an “immediate” drainage area = 4.0

3. All Water Bodies

GIS Core Data Layer # 7

Name: swqs.shp

Subset: none

Raster file: wc_buff

For this factor in the priority system, all watercourse lines were buffered 300 ft. Buffer cells valued as 1.0

GIS Core Data Layer # 8

Name: njlu95.shp / water.shp

Subset: water_buff

Raster file: water_buff

For this factor in the priority system, all water polygons captured in water.shp were buffered 300 ft then converted to a raster file. Buffer cells valued as 1.0, interior water valued as 0.

Raster combination process for all water bodies data layers

Both rasters were combined using the merge calculation in the raster calculator to generate a single All Water raster grid.

$$\text{All_Water_R} = \text{merge}(\text{water_0}, \text{water_buff}, \text{all_wc_buff})$$

Merge retains the top most raster values therefore the results are as follows for all water courses and water bodies through the State:

All water courses and water bodies = 0
Buffers around all water courses and water bodies = 1.0

4. Potential Public Water Supply Facility Sites

GIS Core Data Layer# 11
Name: ppswfs.shp
Subset: none
Raster file: ppswfs

This file was put into raster format and public water supply facility cells coded 2.

Gis Core Data Layer # 4
Name: njswap_14
Subset: ppswfs_basins
Raster file: ppswfs_bas

Selected out basins that would drain into proposed public water supply facility properties. Added canal basin (below) huc14s and converted file to raster grid coding basins as 1.0.

GIS Core Data Layer # 12
Name: canal_bsn.e00
Subset: canal_drainage
Raster file: no raster generated

Reselected basins upstream of the Trap Rock site from coverage of drainage basins (njswap_14) that are influent to/flow into the Delaware and Raritan Canal. These basins were added to ppswfs_basins above.

Raster combination process for ppswfs layers

Both rasters were combined using the merge calculation in the raster calculator to generate a single ppswfs raster grid.

$$\text{Ppswfs_R} = \text{merge}(\text{water_0}, \text{ppswfs}, \text{ppswfs_bas},)$$

Merge retains the top most raster values therefore the results are as follows for potential public water supply facilities and their drainage basins:

All water courses and water bodies = 0
Drainage areas of potential sites = 1.0
Land area of potential facility sites = 2.0

II FLOOD PRONE AREAS

A. Flood Hazard Areas

1. Flood Hazard Area

GIS Core Data Layer # 13
Name: atlfema, berfema, etc
Subset: fema.shp
Raster file: fema_R

All the county Fema shapefiles were appended to create a statewide file. This file was put into grid format and cells coded so that Zone A, the less accurate delineation = 5 pts, all others 10 pts.

III NATURAL RESOURCES

A. Fresh Water & Salt Water Wetlands

1. Wetlands

GIS Core Data Layer # 8
Name: njlu95.shp / wet95d.shp
Subset: none
Raster file: wetbuff_R

NJDEP\ Bureau of Geographic Information Analysis reselected all wetlands coded as TYPE95 = wetlands. This generalized code captures all wetland types (i.e. agricultural, deciduous wooded, herbaceous etc.). The selected polygons were dissolved into a shapefile. New Jersey Geological Survey buffered the dissolved polygons to 300 ft and then converted it to a grid. All wetlands and buffers were coded as 5.

2. Forests

GIS Core Data Layer # 8
Name: Njlu95 / njlu95forest.shp
Subset: none
Raster file: forest_R

NJDEP\ Bureau of Geographic Information Analysis reselected all polygons coded as TYPE95 = forest. Raster generated and forests cells coded as 5.

Raster combination process for natural resource layers

Both rasters were summed in cell statistics to generate a single natural resources raster grid.

$$\text{Nat_Res} = (\text{wetbuff_R} + \text{forest_R})$$

Summing allowed for accumulation of values where wetlands with their buffered areas fell within a forested area. The results are as follows:

Wetlands and buffered area = 5
Forested area = 5
Wetlands and buffers within forested area = 10

IV FAUNA

A. Critical Habitat for Wildlife

1. Landscape Protection

GIS Core Data Layer #14
Name: emergent.shp, forest.shp, etc
Subset: none
Raster file: Landscape_R

Each landscape file was put into grid format using the rank/conservation status to value the cells. The raster cells were reclassified to meet the priority system points assigned to each rank (see table 1 for values). The 5 grids were then added together to create one landscape grid. The cell retained the summed value except where the result was calculated higher than the allowable 10 points for this major factor. In those cases the cell was reassigned a value of 10 in the final grid.

VI. FLORA

A. Natural Heritage Priority Sites (NHPS)

GIS Core Data Layer # 15
Name: prisites.shp
Subset: gaprisites.shp
Raster File: ga_nhpsites_R

Subset of prisites file (gaprisites.shp) created by ONLM captures only rare plant species and natural community sites. ONLM added an attribute "RANKPoints" to the file in order to assign points that correspond to the natural heritage priority sites criteria they established in the priority system. This file was rastered using those values in RANKPoints. Standard sites ranked B1,2,3,4 = 10 pts; Standard Sites ranked B5 and Macrosites ranked B1-4 = 5pt; Macrosites ranked B5 = 2 pts.

B. Rare Flora & Natural Vegetative Communities

GIS Core Data Layer # 16
Name: nhpgrid.shp
Subset: in house use only ONLM
Raster File: nhpgrid_R

ONLM created a subset of the nhpgrid by first selecting out cells that contain one or more viable occurrences (precisely known locations) of rare plant species and natural communities. In the database all occurrences were assigned a priority system point value that corresponds to its TNC rarity ranks. The final grid cell rank was determined by the highest ranking species in the cell. Values were added to the "RANKPTS" field. Green Acres then rastered this file using the "RANKPT" values of 10,8,and 3.

Raster combination process for fauna layers

Rasters created for each then combined and highest score taken for each grid cell.

Appendix III

Methodology for Compilation of Maps Presented in Land Preservation Plan

Two of the requirements of the Open Space Master Plan are 1) to identify areas throughout the State for water resource protection including those areas needed to assure adequate quality and quantity of drinking water in times of drought and 2) to identify lands where state acquisition for recreation and conservation purposes are likely to occur. Attempts have been made to identify such areas through a combination of map results generated in the environmental factors analysis in the Priority System and specific GIS mapped data sets that reflect the program goals of Natural & Historic Resources.

The marriage of these data sets is best viewed as a series of maps, each highlighting different components of the State Open Space Acquisition Priority System and acquisition goals currently sought by Natural & Historic Resources programs. The following sections provide details into the specific data sets used to compile these maps and what aspects of these mapping efforts and goals are displayed in this map series.

A Priority System Data (as used in) Open Space Master Plan Maps

See Appendices I and II for details of priority system.

1. All Environmental Data

The 13 Sub Factor grids generated for use in the priority system were combined through GIS overlay analysis using the raster calculator to generate one final statewide environmental grid (FINAL GRID).

(See Table 1 Appendix III for schematic showing the grid combination process).

After the interim grids were combined, the resulting Major Factor Grids: WATER, FLOOD PRONE, and NATURE were added together. Included in the calculation formula were the multipliers of 2 and 3 as required by P.L. 2002, Chapter 76, commonly known as the Smith Act. The resulting cells in the FINAL GRID had values ranging from 0 – 127. This FINAL GRID was then reclassified into three categories, representing high, moderate and low resource quality using the natural breaks classification approach. With this approach the computer identifies places where significant changes are seen in the values of the data and groups cells based on those changes. In the map series, Maps 1, 2, 4 & 5 display the Priority System's Environmental Resource Data, but show only the moderate and high resource value areas of the FINAL GRID; low resource value areas are omitted.

2. Water Resource Priorities & Flood Prone Areas

The priority system elevates water protection lands and flood prone areas to high resource quality by assigning 3 and 2 times more weight to those factors than any other.

It is critical to extract these data components from the GIS map analysis and allow them to stand on their own in order to highlight where they are located statewide. To do this, the Major Factor WATER grid and FLOOD PRONE grid are reclassified for the map series. The FLOOD PRONE grid reclassified cells in FEMA flood hazard areas as high resource quality and the FEMA Zone A areas as moderate quality. The WATER grid (which is a combination of groundwater protection and surface water protection grids) was reclassified by extracting the highest valued pixels that approximate 40% of state's land area. This is broken down into the top 20% representing high water source quality and the following 20% as moderate water source quality. These statewide representations of flood prone areas and water protection lands are presented in Map 3, 4 & 5.

B Natural & Historic Resource Priority Areas as Presented in the Open Space Master Plan Maps

Acquisition goals of specific Natural & Historic Resource Programs were emphasized by utilizing grids already created in the priority system evaluation process and by the generation of one new data set. Each data set was approved/endorsed by program administration.

1. Landscape & Natural Heritage Data

From the 5 original base factor grids from the landscape project, cells containing either Federally Threatened or Federally Endangered species wildlife habitat are coded as high priority areas. Cells containing State Threatened or Endangered habitats are labeled moderate preservation. All other ranks were omitted.

From the base factor grids in flora, the Natural Heritage Priority Sites grid cells containing standard sites ranked B1, B2, B3 or B4 were coded high priority. The standard site ranked B5 or macro sites ranked B1, B2, B3 and B4 were selected from the grid and coded as moderate. All other ranks were omitted.

Rare flora and natural vegetation grid cells containing state or globally rare ranks S1,G1 or G2 were coded high. Cells containing state or globally rare ranks S2, or G3 are coded moderate. All others were omitted.

2. Buffers Around State Preserved Lands and Recreational Areas

Areas adjacent to state owned lands are highly sought after expansion sites for preservation areas or recreational facilities. Based on this acquisition priority, a 300 ft buffer was generated around all State owned preserved open space and recreational lands. This buffer was rastered and coded as high priority.

The moderate and high N&HR priorities are overlaid to priority system's moderate and high quality environmental resource data in Map 2. No effort was made to distinguish between N&HR priorities and priority system moderate and high values. All moderate

values appear in light orange. All high value areas appear in dark orange. In maps 4 & 5 this same combination is repeated.

C. Existing Preserved Open Space Land

Existing preserved open space is the last data category used in the open space master plan maps.

The goal of the master plan is to identify areas to preserved for water resource protection, conservation purposes and recreational needs. Lands already preserved are identified in order to paint a more realistic picture of the remaining lands available for preservation. Displaying developed lands would be highly desirable, but that information is not readily available.

Green Acres is responsible for keeping an inventory of open space land in New Jersey. The individual GIS data layers developed to identify these lands have been generated from a variety of sources and are as accurate as the source data permits. Below is a list of open space data layers presented in Map 5. All are maintained by Green Acres except for preserved farmland which is generated by the New Jersey Department of Agriculture:

State Preserved Open Space

State Owned Conservation Easements

Federally Preserved Open Space & Military Lands

Local Preserved Open Space and Recreation Areas (county and municipal land)

Non Profit Open Space Funded by Green Acres

Severed Pinelands Development Credits (PDC)

Preserved Farmland

Table 1. Appendix III

Raster Grid Combinations for Open Space Master Plan Maps

13 SUB FACTOR GRIDS	How Combined	Interim Grids	How Combined	Major Factor Grids	Smith Bill Multiplier
whpa_R grw123_R aquifer_R	addition maximum points	ground water	Addition Maximum Points	WATER	* 3
intake_R sswr_R all_water_R ppswfs_R	addition with maximum points	surface water			
fema_R				FLOOD PRONE	* 2
wetbuff_R forest_R	addition with maximum points	natural resources	Addition Maximum Points	NATURE	* 1
landscape_R	just renamed	fauna			
ga_nhpsites_R nhpgrid_R	higher value taken	flora			
		-		-	

FINAL GRID